

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE;

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[The MINING JOURNAL is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.]

No. 2212.—VOL. XLVIII.

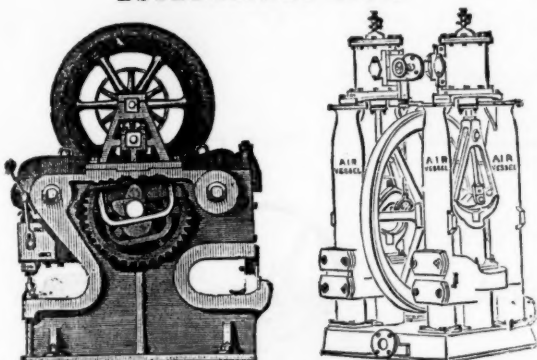
LONDON, SATURDAY, JANUARY 12, 1878.

PRICE (WITH THE JOURNAL) SIXPENCE.
PER ANNUM, BY POST, £1 4s.

JOHN CAMERON'S

SPECIALITIES ARE ALL SIZES OF

Steam Pumps, Shipbuilders' Tools,
BAR SHEARS.
ESTABLISHED 1852.



OLDFIELD ROAD IRON WORKS,
SALFORD, MANCHESTER.

For Excellence
and Practical Success
of Engines



Represented by
Model exhibited by
this Firm.

HARVEY AND CO.

ENGINEERS AND GENERAL MERCHANTS,
HAYLE, CORNWALL.

LONDON OFFICE,—186, GRESHAM HOUSE, E.C.

MANUFACTURERS OF

PUMPING and other LAND ENGINES and MARINE STEAM ENGINES
of the largest and most approved kinds in use, SUGAR MACHINERY,
MILLWORK, MINING MACHINERY, AND MACHINERY IN GE-
NERAL. SHIPBUILDERS IN WOOD AND IRON.

MANUFACTURERS OF

HUSBAND'S PATENT PNEUMATIC STAMPS.

SECONDHAND MINING MACHINERY FOR SALE,
In Good Condition, at Moderate Prices—viz.,

PUMPING ENGINES; WINDING ENGINES; STAMPING ENGINES;
STEAM CAPSTANS; ORE CRUSHERS; BOILERS and PITWORK of
various sizes and descriptions; and all kinds of MATERIALS required for
MINING PURPOSES.

LYON & DAVISON,

IRONFOUNDERS, ENGINEERS, &C.,
Haydon Bridge, near NEWCASTLE-ON-TYNE,

Manufacturers of

LEAD SMELTING, REDUCING, AND REFINING FURNACES,
SLAG HEARTHES, AND SMELTERS' WORK GEAR.

Plans and Estimates furnished for improved Lead or Copper Mining and
Smelting Plant.

ST. LAWRENCE ROPE WORKS,

NEWCASTLE-ON-TYNE. Established 1782.

THOMAS AND WILLIAM SMITH,

Manufacturers of all kinds of Iron; Steel, Copper, and Galvanised Wire Ropes;
Hemp and Manila Ropes, &c.; Round and Flat Shaft Ropes; Crab Ropes; Guide
Ropes; Hauling Ropes; and Galvanised Signal Strand; Ship's Standing Rigging
fitted complete; Patent Hemp and Manila Hawseers, Warps, Cordage, Spun-yarn,
&c., &c.; Manila Yarn for Telegraph Cables, and Flat Hemp Ropes for Driving
Bands; Steel Plough Ropes; Fencing Wire and Stand Lightning Conductors, &c.

OFFICES—

1, QUEEN STREET, NEWCASTLE-ON-TYNE; DOCK YARD, NORTH
SHIELDS; 17, PHILPOT LANE, LONDON, E.C.

STORES—North Shields, Blackwall, Newcastle, and Tyne Dock.

STANDARD LUBRICATING OILS
COMPANY, LIMITED.

DARK and PALE OILS for MACHINERY, RAILWAY, and MINING
PURPOSES, from TWO SHILLINGS per gallon, and upwards.

AGENTS WANTED.

95, CANNON STREET, LONDON, E.C.

ALEX. CHAPLIN AND CO.,

CRANSTONHILL ENGINE WORKS, GLASGOW.

PATENTERS AND SOLE MANUFACTURERS OF

CHAPLINS' PATENT STEAM CRANES, HOISTS,

LOCOMOTIVES, AND OTHER ENGINES AND BOILERS.

LONDON HOUSE:—

MCKENDRICK, BALL, AND CO.,

43 QUEEN VICTORIA STREET, LONDON, E.C.



PARIS,
BRONZE MEDAL, 1867.



ORDER OF THE CROWN OF PRUSSIA.



FALMOUTH,
SILVER MEDAL, 1867.

A DIPLOMA—HIGHEST OF ALL AWARDS—given by the
Geographical Congress, Paris, 1875—M. Favre, Contractor, having
exhibited the McKean Drill alone as the MODEL BORING MACHINE
for the ST. GOTHARD TUNNEL.

SILVER MEDAL of the Highland and West of Scotland
Agricultural Society, 1875—HIGHEST AWARD.

At the south end of the St. Gothard Tunnel, where

THE MCKEAN ROCK DRILLS

Are exclusively used, the advance made during eight consecu-
tive weeks, ending February 7, was 24'90, 27'60, 24'80, 26'10,
28'30, 27'10, 28'40, 28'70 metres. Total advance of south head-
ing during January was 121'30 metres, or 133 yards.

In a series of comparative trials made at the St. Gothard Tun-
nel, the McKean Rock Drill continued to work until the pres-
sure was reduced to one-half atmosphere (7½ lbs.), showing
almost the entire motive force to be available for the blow
against the rock—a result of itself indicating many advantages.

The GREAT WESTERN RAILWAY has adopted these
Machines for the SEVERN TUNNEL; the LONDON AND
NORTH-WESTERN RAILWAY for the FESTINIOG TUN-
NEL; and the BRITISH GOVERNMENT for several Public
Works. A considerable number of Mining Companies are now
using them. Shafts and Galleries are driven at from three to
six times the speed of hand labour, according to the size and
number of machines employed, and with important saving in
cost. The ratio of advantage over hand labour is greatest
where the rock is hardest.

These Machines possess many advantages, which give them
a value unapproached by any other system of Boring Machine.

THE MCKEAN ROCK DRILL IS ATTAINING GENERAL
USE THROUGHOUT THE WORLD FOR MINING, TUN-
NELLING, QUARRYING, AND SUB-MARINE BORING.

The MCKEAN ROCK DRILLS are the most powerful—the
most portable—the most durable—the most compact—of the
best mechanical device. They contain the fewest parts—have
no weak parts—act without SHOCK upon any of the operat-
ing parts—work with a lower pressure than any other Rock
Drill—may be worked at a higher pressure than any other
—may be run with safety to FIFTEEN HUNDRED STROKES
PER MINUTE—do not require a mechanic to work them—are
the smallest, shortest, and lightest of all machines—will give
the longest feed without change of tool—work with long or
short stroke at pleasure of operator.

The SAME Machine may be used for sinking, drifting, or
open work. Their working parts are best protected against
grit and accidents. The various methods of mounting them
are the most efficient.

N.B.—Correspondents should state particulars as to
character of work in hand in writing us for information,
on receipt of which a special definite answer, with
reference to our full illustrated catalogue, will be sent.

PORTABLE BOILERS, AIR COMPRESSORS, BORING STEEL,
IRON, AND FLEXIBLE TUBING.

The McKean Drill may be seen in operation daily in London.

MCKEAN AND CO.

ENGINEERS.

OFFICES,

5, RUE SCRIBE, PARIS.

MANUFACTURED FOR MCKEAN AND CO. BY

Messrs. P. and W. MACLELLAN, "CLUTHA IRONWORKS,"
GLASGOW.

SMITH & FORREST,
OIL REFINERS,
ROSIN OIL DISTILLERS,
GREASE AND VARNISH MANUFACTURERS,
HOLT TOWN.
MANCHESTER.

Price List on application.

[ESTABLISHED TEN YEARS.]

DUNN'S ROCK DRILL,
AND
AIR COMPRESSORS.

FOR DRIVING BED ROCK
TUNNELS, SINKING
SHAFTS, AND PERFORMING
OPEN FIELD OPERATIONS,

IS THE
CHEAPEST, SIMPLEST,
STRONGEST, & MOST EFFECTIVE
DRILL IN THE WORLD.

Dunn's Patent Rock Drill Company
(LIMITED).

OFFICE,—193, GOSWELL ROAD
LONDON, E.C.

THE
PATENT SELF-ACTING MINERAL
DRESSING MACHINE COMPANY
(LIMITED).

T. CURRIE GREGORY, C.E., F.G.S.

OFFICES,—GLASGOW: 4, WEST REGENT STREET.
LONDON: 52, QUEEN VICTORIA STREET, E.C.

IMPORTANT NOTICE TO MINE PROPRIETORS.

MR. GEORGE GREEN, ENGINEER, ABERYSTWTH
SUPPLIES MACHINES under the above Company's Patents for
DRESSING ALL METALLIC ORES. Dressing-floors having these Machines pos-
sess the following advantages:—

- 1.—THEY ARE CHEAPER THAN ANY OTHER KIND IN FIRST OUTLAY.
- 2.—ONLY ABOUT ONE-FOURTH OF THE SPACE USUALLY OCCUPIED
BY DRESSING-FLOORS IS REQUIRED.
- 3.—FROM 60 TO 70 PER CENT. OF THE LABOUR IN DRESSING, AND
FROM 5 TO 10 PER CENT. OF ORE OTHERWISE LOST, IS SAVED.
- 4.—THEY ARE THE ONLY MACHINES THAT MAKE THE ORE CLEAN
FOR MARKET AT ONE OPERATION.

They have been supplied to some of the principal mines in the United Kingdom
and abroad—viz.,

The Greenside Mines, Patterdale, Cumberland; the London Lead Company's Mines
Darlington, Colberry, Nanthead, and Bollyhope; the Stoncroft and Greyside
Mines, Hexham, Northumberland; Wanlockhead Mines, Abington, Scotland (the
Duke of Buccleuch's); Bewick Partners, Haydon Bridge; the Old Darren, Egar-
mwyn, and Ystumtuen Mines, in Cardiganshire; Mr. Beaumont's W.B. Mines,
Darlington; also Mr. Sewell, for Argentiferous Copper Mines, Peru; the Brats-
berg Copper Mines, Norway, and Mines in Italy, Germany, United States of
America, and Australia, from all of whom certificates of the complete efficiency of
the system can be had.

WASTE HEAPS, consisting of refuse chatts and skimpings of a
former washing, containing a mixture of lead, blende, and sulphur
DRESSED TO A PROFIT.

Mr. BAINBRIDGE, C.E., of the London Company's Mines, Middleton-
in-Teesdale, by Darlington, writing on the 20th March, 1876, says—"The yearly
profit on our Nanthead waste heaps amounted last year to £800, besides the ma-
chinery being occupied for some months in dressing ore-stuff from the mines. Of
course, if it had been wholly engaged in dressing wastes our returns would have
been greater; but it is giving us every satisfaction, and bringing the waste heaps
into profitable use, which would otherwise remain dormant."

Mr. T. B. STEWART, Manager of the Duke of Buccleuch's Mines,
Wanlockhead, Abington, N.B., writing on 20th March, 1876, says—"I have much
pleasure in stating that a full and superior set of your Ore Dressing Machinery has
been at work at these mines for fully a month, and each day as the moving parts
become smoother, and those in charge understand the working of the machinery
better, it gives increasing satisfaction, the ore being dressed more quickly, cheaply,
and satisfactorily than by any other method."

Mr. BAINBRIDGE, speaking of machinery supplied Colberry Mines,
says—"Your machinery saves fully one-half on old wages, and vastly more on the
wages we have now to pay. Over and above the saving in cost is the saving in ore,
which is a much short of 10 per cent."

GREENSIDE MINE COMPANY, Patterdale, near Penrith, say—"The
separation which they make is complete."

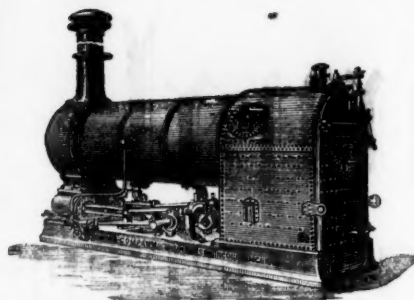
Mr. MONTAGUE BEALE says—"It will separate ore, however close
the mechanical mixture, in such a way as no other machine can do."

Mr. C. DODSWORTH says—"It is the very best for the purpose
and will do for any kind of metallic ores—the very thing so long needed for dress-
ing-floors."

Drawings, specifications, and estimates will be forwarded on application to—
GEORGE GREEN, M.E. ABERYSTWTH SOUTH WALES

ROBEY & CO., ENGINEERS, LINCOLN,

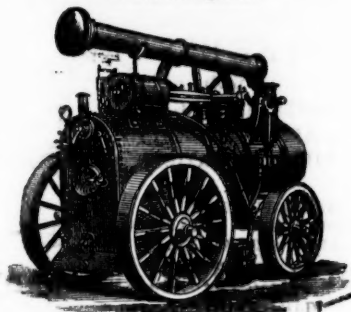
SOLE MANUFACTURERS OF THE



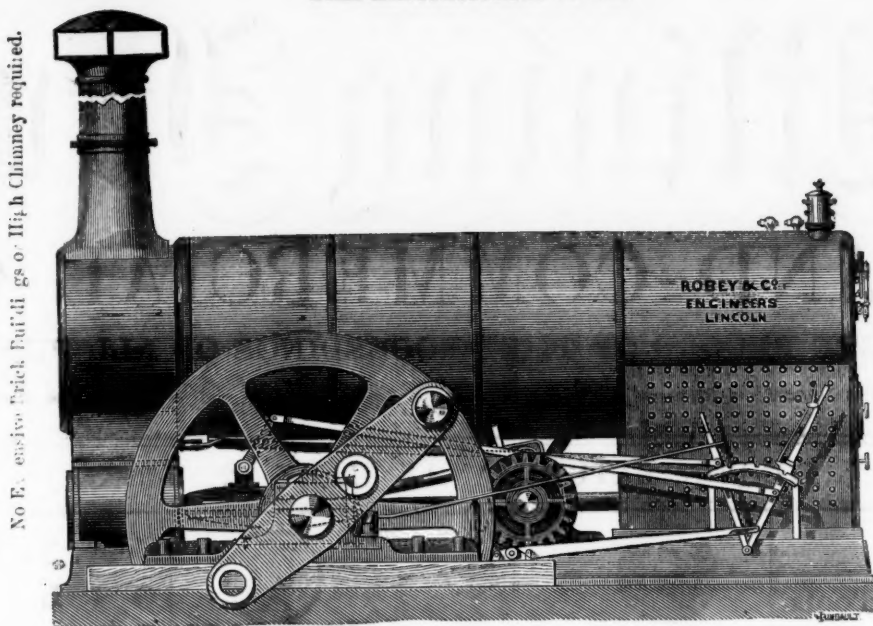
THE PATENT ROBEY FIXED ENGINE AND LOCOMOTIVE BOILER COMBINED, 4 to 50-horse power.



VERTICAL STATIONARY STEAM ENGINE AND PATENT BOILER COMBINED, 2 to 12 horse power.



SUPERIOR PORTABLE ENGINES, 4 to 6 horse power.



PATENT IMPROVED ROBEY MINING ENGINE,

OF ALL SIZES, FROM 4 TO 50-HORSE POWER.

Some of the advantages of this New Engine are as follows:—

SMALL FIRST COST. SAVING OF TIME AND EXPENSE IN ERECTING. EASE, SAFETY, AND ECONOMY IN WORKING. GREAT SAVING IN FUEL.

This New Engine is free from all the objections that can be urged against using the Semi-Portable Engine for permanent work, because it possesses the rigidity and durability of the Horizontal Engine, and at the same time retains the advantages of the Semi-Portable in saving time and expense in fixing.

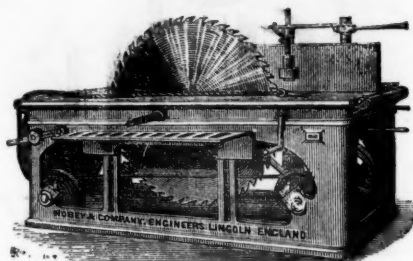
THE PATENT ROBEY FIXED ENGINE

(Also above illustrated) is admirably adapted for driving Rolling Mills, Saw Mills, Brick Machinery, Pumping Machinery, and all descriptions of Fixed Machinery.

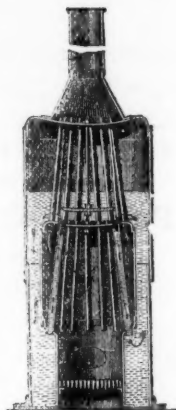
ENGINES UP TO 200 EFFECTIVE HORSE-POWER
ALWAYS IN PROGRESS.

Prices and full particulars of all the Machinery here illustrated on application to the Sole Manufacturers,

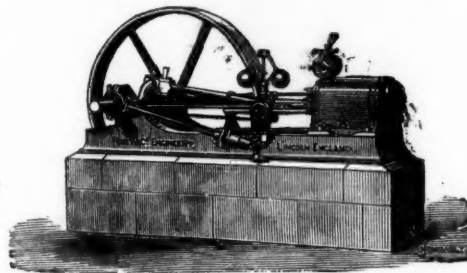
ROBEY & CO.,
ENGINEERS, LINCOLN, ENGLAND.
London Office: 117, Cannon Street, London, E.C.



SELF-ACTING CIRCULAR SAW BENCH.



PATENT VERTICAL BOILERS,
2 to 12 horse power.



IMPROVED HORIZONTAL FIXED STEAM
ENGINE,
4 to 60-horse power.

PATENT
"INGERSOLL ROCK DRILL,"
LE GROS, MAYNE, LEAVER, & CO.,
60, Queen Victoria Street, London, E.C.
5, PARK PLACE, NEW YORK, U.S.A.



We claim 40 per cent. greater effective drilling power, and offer to compete with any machine of its class.

The following extracts from the reports of Judges in awarding Medals:—

"2. Its simple construction ensures durability, &c.

"4.—The steam or air cushions at each end of cylinder effectually protect from injury

"5. Its having an automatic feed, giving it a steady motion, &c

"6. Its greater steadiness and absence of jar and vibration experienced in other drills, which is very destructive to their working parts, &c.

"7. Its greater power is some FORTY PER CENT. in favour of the Ingersoll."

Medals awarded for several years in succession "For the reason that we adjudge it so important in its use and complete in its construction as to supplant every article previously used for accomplishing the same purpose."

Estimates given for Air Compressors and all kinds of Mining Machinery. Send for Illustrated Catalogues, Price Lists, Testimonials, &c., as above.

Now ready, price 3s., by post 3s. 3d., Sixth Edition; Twentieth Thousand Copies much improved, and enlarged to nearly 300 pages.

HOPKIN'S CONVERSATIONS ON MINES, between Father and Son. The additions to the work are near 80 pages of useful information, principally questions and answers, with a view to assist applicants intending to pass an examination as mine managers, together with tables, rules of measurement, and other information on the moving and propelling power of ventilation, a subject which has caused so much controversy.

The following few testimonials, out of hundreds in Mr. Hopkin's possession, speak to the value of the work:—

"The book cannot fail to be well received by all connected with collieries."—*Mining Journal*.

"Its contents are really valuable to the miners of this country."—*Miners Conference*.

"Such a work, well understood by miners, would do more to prevent colliery accidents than an army of inspectors."—*Colliery Guardian*.

London: MINING JOURNAL Office, 25, Fleet-street; and to be had of all book-sellers.

THE "CHAMPION" ROCK BORER

STANDS UNRIVALLED

For Tunnels, Mines, Quarries, Harbour Works, Cutting
Blocks of Granite, &c.



The working parts are made of the toughest steel and phosphor-bronze—steel castings are also used—so as to combine strength with light weight

AIR-COMPRESSING MACHINERY

Of the simplest and best construction.

Combined Water-pressure Engines and Air-compressors,
Giving most excellent results.

ULLATHORNE AND CO., Mechanical and Consulting Engineers,
63, QUEEN VICTORIA STREET, LONDON, E.C.

THE "CRANSTON" ROCK DRILL

SUITABLE FOR

QUARRYING, SINKING SHAFTS, SUBMARINE BLASTING, TUNNELLING, DRIVING ADITS,

is the MOST SIMPLE and ECONOMICAL DRILL now in use.

BOILERS; AIR COMPRESSORS, worked by Hydraulic or Steam-power; STEEL for MINING DRILLS; PUMPS, and all other MINING MACHINERY supplied.

Extract from Capt. DRAKE'S Report to the Eberhardt and Aurora Mining Company, London:—"After having visited and carefully inspected the working of the principal patterns of drills used, particularly with reference to the tunnel works in the Comstock Mines, in California, we are pleased to believe there is no better drill than the 'Cranston,' which is doing most excellent service. The tunnel is driving through exceedingly hard limestone intermixed with quartz rock, which is all to blast. Since the arrival of new drills we have been enabled to let a contract for 500 feet, and we now average 50 feet per week."

The tunnel is now driven in over 2000 feet by their drills.

For other particulars and estimates, apply to—

J. G. CRANSTON, 22, GREY STREET,
NEWCASTLE-ON-TYNE

THOMAS TURTON AND SONS,

MANUFACTURERS OF

MINING STEEL of every description.

CAST STEEL FOR TOOLS. CHISEL SHEAR, BLISTER, & SPRING STEEL.

MINING TOOLS & FILES of superior quality.

EDGE TOOLS, HAMMERS, PICKS, and all kinds of TOOLS for RAILWAYS, ENGINEERS, CONTRACTORS, and PLATELAYERS.
LOCOMOTIVE ENGINE, RAILWAY CARRIAGE and WAGON SPRINGS and BUFFERS.

SHEAF WORKS & SPRING WORKS, SHEFFIELD.

LONDON OFFICES.—35, QUEEN STREET, CITY. PARIS DEPOT.—12, RUE DES ARCHIVES.
NEW YORK STORE.—102, JOHN STREET.

Original Correspondence.

BOARD OF TRADE RETURNS CONCERNING THE IMPORT AND EXPORT OF SUPERIOR METALS FOR 1877.

The Government statistics of commerce for 1877 have now been published, and we cannot suppose that, so far as our foreign trade is concerned, that the last year has been worse than the former. The value of exports for 1877 was 198,731,073*l.*, against 200,639,204*l.* in the previous year, a falling off not considerable, although both years show a decline in the values of exports from 1875 to about 20,000,000*l.* The general exports for the last month have increased by 500,000*l.*, although more than 1,000,000*l.* beneath those of 1875 in the same month. The imports for the year are returned as of the value of 393,941,256*l.*, nearly 16,000,000*l.* more than last year, and about 20,000,000*l.* more than the year before. It is consequent upon such statistics that, although our export trade has slightly decreased, the general trade of the country has vastly increased, and the statements continually published to the world of the decline of trade are evidently false. It may be that the home trade has decreased, and that all trade has been less lucrative; but there can be no mistake that, taking our imports and exports together, there has been not only no decline but a vast augmentation of the foreign trade. It is an error to look only to exports as indicators of the course of trade, because imports show profits, repayments, returns of dividends, &c., or else they would be proof of indebtedness; but as our imports are always much greater than our exports, if they represented indebtedness there would long ago have been a commercial collapse of the greatest magnitude. Besides, a considerable amount of those imports are exported again with a profit. This department of business amounted during the year to a much larger value than the year before.

What is true of the general commerce of the country is so of the trade in metals, and, as a matter of course, whatever may be the home consumption, much of the prosperity of our miners and investors in mining property will always depend upon the range of our commerce in metals. We will first notice Lead, as our lead mines are at present in favour with capitalists, the metal being more accessible and cheaply worked than any other. The imports have been of the value of 2,015,438*l.*, more than a quarter of a million beyond last year. The last month of the year showed great activity in this respect, the imports having been valued at 175,648*l.*, being in round numbers 66,000*l.* more than in December, 1876, and, indeed, greater than in any corresponding month within our memory. This may, perhaps, alarm the pessimists for the prosperity of British lead mines, but it need not, because we do not raise anything like what we require for ourselves, and there is a considerable foreign demand for British lead. In proof that there need be no apprehension on the part of capitalists holding property in lead mines, we may mention that we use up for ourselves all the lead we import, while the finest qualities we raise are bought for export. We anticipate that there will be a great future for British lead mining, a noble prospect for enterprise is opening up in lead mining properties of the British Isles, safe, sure, and profitable enterprise, which may be prosecuted to an extent vast, and vastly remunerative. The value of British lead exported during the year was 913,218*l.*, against 809,095*l.*—a most satisfactory return of figures. The month's return was close upon 60,000*l.*, a larger amount than in any previous December of which we have the statistics before us. These figures will account for the partiality with which lead mines have been regarded during 1877 by mining investors. It ought to be noticed as an element of success in this department of metal mining that a larger proportion of the mines are in private hands than is the case in the instances of the other superior metals; for, as a rule, no public company, cost book or limited, will work a mine so efficiently as a private firm. The moderate depth at which the metal lies in comparison with tin, copper, iron, &c., the smaller amount of capital required, and the comparative rapidity of returns, serve to explain this phenomenon. Possibly some disposed to grumble may say that we sent more in quantity away than proportionately we received money for; but the slightest attention to the tables of exported quantities will confute this. The fact indubitably is that we have had a good and profitable trade in lead this year, and we ought to be thankful and take courage. The returns do not indicate any change in the course of this business. Russia was one of our best customers, but with that country the lead market proves a steadily and rather rapidly declining trade. There has been more British lead imported for war purposes by the Muscovite, but greatly less for the uses of peace. We send more lead to China than elsewhere, much of which is consumed by the European and American merchants, especially English and Portuguese. This commerce universally increased last year, except so far as France was concerned, with which there was a decrease of about 18 per cent., caused by the political condition of the country and the consequent commercial disasters. The increase of this particular trade with the United States is a most cheerful feature of it. It was twice as large in 1877 as in 1876, and nearly ten times as great as the year before that. With nearly every country that takes only small quantities there has been an improved business, and our grand Imperial colonies of India and Australia were splendid customers. Our dealings in this metal with these magnificent countries are necessarily destined to become greatly enlarged, especially as tea cultivation increases in Assam and the Hill border regions. Our exports were in every form the metal can be made to assume, especially rolled. The imports were almost entirely confined to pig and sheet, but the officials have not furnished us with the proportions. We know from other sources that the great body of the quantities imported was in the form of pig, but at present we have to deal exclusively with authorised official statistics.

Next to lead, Tin engaged the public attention, and indeed for a portion of the year more than even lead, but the advance gained has not been entirely sustained, and, in fact, quotations are now lower than they were this time twelve months. Nevertheless, tin mining seemed to get a new start, and encouragement is still felt as to an approaching revival, but it is evident that at present prices tin cannot be raised in sufficient quantities for our consumption and our customers. We imported somewhat less, which was a seasonable relief to the market; the value was 961,330*l.*, against nearly 200,000*l.* more in 1876, and 500,000*l.* more in 1875. The diminution in the month's imports has been quite in proportion. Very little foreign tin arrived last month—only to the value of 42,000*l.* This is partly accounted for by the fact that foreigners do not buy Straits and Australian tin here to the extent which they did. We re-shipped over 120,000*l.*, less than during last year. But there are tokens of a great revival in this department of the tin trade; during the month the re-shipments were valued at 23,703*l.*—not far from three times as much as in December, 1876. The export of British tin was valued for the year at just upon the point of 500,000*l.*—an increase of about 20 per cent., so that we got less from the foreigner, and the foreigner got more from us; this is surely good news for the readers of the Journal from the Lands End or the Lizard to Dartmoor. The course of the trade has been very satisfactory. France, for the reasons before given, fell off as a customer; as the people were afraid that they would have to use heavier metal than tin to secure their liberties. The United States has doubled her imports. We may now consider the reports of tin mines in California of any importance—as worthy of no notice. Turkey fell off a little from the exhaustion of the war, and would from this cause have been a worse customer still but that the Turkish soldiers carry their food and water in tin canteens.

The Copper trade is a large and important one, especially when it is considered our bronze, brass, and plated productions, of which no statistical account can be accurately given. The import of copper ore is always a sure indication of trade in the metal, as we do not produce copper enough for commerce and our wants. The imports for the year were of the declared value of 1,164,710*l.*, against 926,936*l.* last year, and 748,899*l.* the year before. During December the increase was such as to show that a hope of better demand for

copper largely prevailed. The value of regulus, including precipitate, also increased, having been 1,198,549*l.*, a great increase upon last year. In the month of December this trade was largely developed, having more than doubled as compared with the corresponding period last year, and having been three times as much as in that of the year before. It is to be observed that wrought and part wrought copper fell off, which is favourable to the home maker; the value was 2,856,717*l.* The import of wrought copper declines rapidly, whereas the import of ores and regulus increases. Of the copper we did import nearly half was re-shipped, giving the merchant, of course, a profit on the transactions, and employing our ships and sailors. The declared value of British copper exported exceeded 3,000,000*l.*, more than one-third of which was sheathing. British India was a grand customer, taking over 380,000*l.* worth of manufactured copper; France took 359,200*l.* worth of ingots, cakes, and slabs; Germany, Holland, and Belgium were large customers in the same direction. We want a few more Devon Great Consols; will Mr. Josiah Hitchens go and look for them? As closely connected with copper, Brass demands attention, the export was valued at 443,438*l.* slightly below the average.

Pyrites of copper, iron, or sulphur were imported to the value of 1,646,132*l.* This does not include British imports from Ireland. These imports are very advantageous to us, and increase prodigiously.

Our imports of Quicksilver diminish with great velocity, and none of the reasons we have heard assigned adequately account for the fact. Our re-exports also decline in proportion, so that it appears our old customers get the metal from Spain and California direct. This will, of course, be the case with the United States.

The imports of Zinc exceeded 1,100,000*l.*, a decided increase upon last year. The export of British zinc—only 128,924*l.*—is only a little more than last year.

From these authorised statistics we are justified in saying that whatever has been the state of the home trade our foreign commerce for the year 1877 affords cheerful promise to the miner, metal merchant, and investor.

HEAT OF COMBUSTION OF FIRE DAMP.

SIR.—In his evidence at the inquest on the Pemberton Explosion Mr. Wm. Armstrong states that the heat of the combustion of fire-damp is equal to twice that of a blast-furnace (1530° × 2) or 3060° cent. I make the heat 3418°. Thus, according to Deschanel, Dulong proved that 1 lb. of fire-damp will raise by its combustion 13,063 lbs. of water 1° cent.

The specific gravity of fire-damp is .5527, therefore 1 lb. of it will occupy $\frac{1306}{.5527} = 2363$ cubic feet. If this quantity of fire-damp be mixed with seven times its volume of atmospheric air the result of its combustion will be 189.04 cubic feet of after-damp, neglecting the expansion caused by heat. 76 parts of after-damp contain:—

11 parts of carbonic acid,	1.521	specific gravity = 16.731
56 " nitrogen	.9734	" = 54.393
9 " steam	.625	" = 5.625

Total 76.750

Therefore the specific gravity of after-damp is very nearly that of atmospheric air, and 13.19 cubic feet will weigh 1 lb.

The specific heats of carbonic acid, nitrogen, and steam being respectively .217, .244, and .475, the specific heat of the after-damp will be .267; and it follows that 3.75 lbs. of after-damp is heated 13,063° by the combustion of 1 lb. of fire-damp.

But the heat of 1 lb. of fire-damp is applied to $\frac{189.04}{13.19} = 14.33$ lbs. of after-damp. Therefore, 14.33 : 3.75 :: 13,063 : $x = 3418^\circ$.

The expansion due to this heat is

$$273 + 16 : 273 + 3418 :: 1 : x = 12.77.$$

That is to say the expansion due to the explosion of a mixture containing 1 part of fire-damp to 7 of air is 12.77 times, and the combustion of 1 lb., or 23.63 cubic feet, of fire-damp will expand 189 cubic feet of after-damp to 2414 cubic feet.

Rutherford, Jan. 7.

ROBT. THOS. MOORE.

GOVERNMENT INSPECTORS OF MINES, &c.

SIR.—I am not at all surprised at "Nobrac's" letter. He is one of a class who wilfully misread statements so as to make an opportunity for publishing their own opinions, which are seldom characterised by anything but very bad taste. "Nobrac" knows a great deal more of Mr. Galloway's movements and desires than I do, and he is evidently a keen observer in this direction. My criticism of this inspector was perfectly independent, but "Nobrac's" animus—clearly shown in his letter—unfits him for playing the rôle of a critic, and relegates him to that numerous band who envy success in another, and who do not miss an opportunity of publishing the fact.

I am sure any person with an ordinary amount of common sense, reading my last letter, will say that I rather "damned with faint praise" Mr. Galloway. I think it unfortunate that he should be content with the mere clerical work of translating another man's work, but I still believe that his labours—*re: The Influence of Coal-Dust in Colliery Explosions*—are worthy of being called original. Bacon says—"If a man performs that which hath not been attempted before, or attempted and given over, or hath been achieved but not with so good circumstance, he shall purchase more honour than by affecting a matter of great difficulty or virtue wherein he is but a follower." The italics are mine. If Mr. Galloway has trodden upon "Nobrac's" toes, or elbowed him out of place or position, why publish it in Gath? "Nobrac" complains that I have attempted to bring Mr. Galloway's name into prominence by anonymous correspondence. This I deny. And further I say that if it had been so it would be much less offensive than trying to injure a man's reputation by anonymous writing. It is not likely that this view of the case would occur to "Nobrac," and it gives one an index to his character which cannot be pronounced as flattering. With regard to the age of the "coal-dust theory," as "Nobrac" says it is much older than my grandfather (who was born in the year 1738), would he refer to some published account of it precedent to that date?

CARBON.

AIR-COMPRESSING MACHINERY.

SIR.—I believe in the proverb that controversy elicits facts, and having seen the controversy upon air-compressing machinery between "A. H." and the patentees of the Reliance Air-Compressor I think, if I may be allowed so to express myself, that "A. H." has shown very bad taste in throwing doubts on your Correspondent's report of the trial of this compressor which took place some weeks since at the manufacturers' works in Lambeth, but being a visitor myself on that occasion, and, besides, somewhat of a practical man in such matters, I take the liberty of fully corroborating your correspondent's statement, having seen the same results. Great credit is due to the genius of the inventors for the production of so valuable a piece of machinery, more especially at this juncture, when the mining interest so much needs it. It is also very gratifying to see that the patentees give their invitation broadcast to the public through the medium of your valuable Journal, and I trust they will meet with the response that they deserve, and as everyone interested can now have the opportunity of testing the machine in question, I hope we may ere long see some further remarks on it. All the world knows that simplicity is of the first and greatest importance in any kind of machinery, and in this respect the Reliance Air-Compressor is almost simplicity itself. The subject of compressed air and compressing machinery has periodically cropped up in the columns of various journals during the last few years, and there are, probably, few things upon which more time and money have been spent, but to all appearances the patentees of the Reliance Air-Compressor have overcome the obstacles so long in the way of inventors. That their compressor is a long step in the right direction is beyond doubt, and if pushed forward other and greater results will be obtained—far beyond the comprehension of such critics as "A. H." To conclude, I for one heartily wish the patentees every success, and com-

mend them for the temperate and honest way in which they have met the ill-timed remarks of "A. H." on your Correspondent's report.

Millwall, Jan. 8.

W. COOK.

DOWLAIS TUNNEL—MERTHYR EXTENSION RAILWAY.

SIR.—Like many of the readers of your valued Journal, which for reliable mining news and information takes precedence throughout the globe, I have from time to time been much interested in the correspondence upon Rock Drills and Rock Drilling, much of which implies that mineowners and others interested in mining are anxiously looking forward and waiting for some improved methods and appliances to assist in the development of their mining properties and the mineral resources of the country. Now, if this is the case, why do we not see more use made of the *Mining Journal* in advertising for working tenders, &c., as always is the practice with civil engineering contracts, as shown by the columns of the engineering journals? Instead of this, mining and sinking contracts are generally let in a "hole-and-corner way" to some local party in the district where the work is to be performed, who happens to be in favour with the viewer, mine agent, or captain, to be carried out by hand labour, at in nine cases out of ten double and treble the original estimate.

For a number of years I have been engaged as foreman under Mr. W. Kenrick, the mining contractor, and who has a contract on this tunnel; for many years in the States he has been using machine drills and nitroglycerine in mining tunnels and other work, during which time we have employed various different machines. We claim, therefore, to know something of rock mining with machinery, and like other men in my avocation like to give and receive fair play, and knowing that facts speak for themselves, I will enumerate our past and present progress upon this job.

The tunnel is in hard limestone rock, and the progress in the headings by hand labour (9 ft. by 7 ft.) averaged 40 ft. per month, or 10 ft. per week. The average drilling of a pair of men being 11 to 13 ft. per day of 12 hours. We have five Ingersoll drills upon the job—one being kept in reserve and four in work; size of drills—24 in. We have 300 ft. of air pipe from the air receiver. Two machines are worked in the open end and full size tunnel, and two down a shaft driving a bottom heading. In commencing work here our average progress ran from 25 to 26 ft. per week of heading, it has now reached 40 ft., and I do not doubt we shall attain 50 ft. per week. The daily record and progress is duly marked on the chart, and the books open to inspection. We shall be happy to give any information, and to forward estimates for work of this description, on application, abroad or at home.

As before stated, facts speak for themselves. We believe in using the best drill and the strongest explosive, with the electric battery to assist us; and if any maker will show us that he has an improved machine to that we are now using we shall be very glad to adopt it immediately, and we shall be happy to hear from any maker who desires to test the merits of his machine upon the work we have now in hand. I may add that one fitter does all our repairs, and that we run at a pressure of from 70 to 90 lbs. Our men are experts at their work, having been accustomed to boring machines, the battery, &c., for years past.

P. TONKINS
(Kenrick, Williams, and Co., sinkers and mining contractors).

Dowlais, Jan. 8.

COPPER MINING AT LAKE SUPERIOR.

SIR.—There has been nothing of special interest to note from this region for quite a long time. Mining matters move along quite regular, but the price of copper ruling low throws a shade over what would otherwise be a very prosperous district. Two years ago the cost of producing copper in our mines, with some rich exceptions, was not less than 20 c. per pound for ingot; at this time 17½ c. is the ruling figure, and yet no important industry has succumbed to low prices. For some it is tight scratching, but, all things considered, better to keep on and be ready when better times come. As might be expected wages have been materially lessened in the last year; miners' wages vary from \$40 to \$50 per month, most mines inclining to the lesser figure.

The output of copper for the year just closing will not vary much from last year, and unless the management of the principal mine thinks fit or a still lower price—scarcely possible that—squeeze some mine out of the producing list no material difference need be looked for in next year's product. The Calumet and Hecla Mine is taking out about 1200 tons of stamp mineral monthly, or about 900 tons of ingot copper. The amount of rock stamped is over 20,000 tons per month. The mine workings are over a mile long on the lode, which varies from 5 to 18 ft. in width. A new compound engine has been set up and started recently on this mine; it runs four 20-ft. drums in one house, to hoist from four shafts at the same time if necessary. Skips carry 1 ton of rock; shafts from 1400 to 1700 feet deep. It runs a compressor to furnish air to run not less than six Barleigh drilling-machines employed underground. Power is also transmitted by wire-rope to work a sufficient number of Blake's rock-breakers to crush to a fine size for the stamps from 300 to 400 tons daily of hard conglomerate rock, carrying commonly a high percentage of native copper. By another attachment it is proposed to run the man-engine and pump with the same engine.

The Quincy Mine produces about 150 tons of 80 per cent. copper monthly. This mine is now down to the 26th level, still maintains its position as a producer, and never produced copper cheaper than at this time. The bottom of the mine is dry, and the temperature not over 60°. A man-engine takes the men up and down, so that they are not troubled by exhaustion in climbing, nor by water or heat in following their occupation.

The Osceola Mine produces about the same quantity of copper as the mine last referred to. This mine is comparatively shallow—6th level, or 650 ft. from surface, the levels being over 100 ft. apart. It is on the Calumet lode, but probably works in another run of copper ground. This concern has just erected a powerful hoisting engine; they are making more or less money.

The Central Mine is the representative mass copper mine of the Lake region just now, and it sent some heavy chunks to the Philadelphia Exhibition last year. It is said that the vein shows better at this time than at any period since work was begun. The product is nearly 100 tons of ingot per month, and was produced last year next in cheapness to the Calumet and Hecla copper.

The Franklin and Atlantic Mines range in production about equal with the Central, but bear no comparison in results. Both mines handle large quantities of low-grade rock, but the present price of copper, though admitting of living, does not afford much margin for profit. Credit is due to the management of both concerns, especially the Franklin, for placing the industries on their present basis. A small rise in the price of metal would enable them to make good profits.

Allouez Mine went under a few months ago, but is being worked extensively on tribute. The mine is good for about 60 tons of ingot copper monthly, and this could be produced without loss after the mine is fairly opened. The management of the work and the condition of the machinery were the worst that this country has seen for many years, and the result surprised but few, if any, people who gave this mine a passing thought.

The Old Cliff is producing but little copper just now, stoping being for the time restricted. The management, however, is sanguine that when certain underground connections are made it will come to the front, as in old days.

Copper Falls, another old standard, is also off in product temporarily. The stockholders here are waiting very patiently the result of a line of work which when complete is expected to put the concern in shape to handle large bodies of low-grade ore profitably. Under any circumstances the mine has good chances in finding bodies of mass copper as in times past, and no doubt will keep on trying until it does.

The Ontonagon Company, which once led the Lake region, seems almost lost for want of energy and action. It is painful to read the comments of the Miner, the county paper, on the present state of affairs. Only two companies are in active operations, a few tributaries being scattered through the many other mines.

Time will bring better days to the county, for it certainly has

abundance of mineral wealth, and experience is continually showing where something can be saved and the cost of producing copper lessened.—*Calmel, Michigan, U.S.A., Dec. 17.* J. D.

TASMANIAN TIN FIELDS—No. V.

SIR,—Below the Star of Hopesouth-west, and running from their boundary to the Ringarooma river is a 40-acre section belonging to the Prince of Wales Company, who have four men and a boy at work with one box in the same gully that the Star of Hope are working in. They have a dam, but the wash is very narrow, about 12 cwt. of tin ore per week is the yield, nearly worked out. From the first claims I have mentioned round the eastern end of the mount to these workings all the tin is carted round that end of the mount to the Ringarooma Port, but from this point onwards the transport is round the western end, over a road that is scarcely passable for drays. Proceeding along the back of the mount over a number of timber and rocky spurs on the Prince of Wales Company's ground in a direction slightly south of west, we reach the manager's residence. This company holds six sections in all, and about a quarter of a mile north of the camp are the present workings, on a small creek, where four men and two boys are employed with one sluice-box. On the face there is about 6 ft. of stripping and 1 ft. of wash-dirt, yielding about 20 cwt. of tin ore per week from the two claims by eight men and three boys. There is some wash running into the hill on one side under a stripping of over 15 ft., and is so loose and treacherous that it cannot be worked without timbering, which is too expensive a mode of working to be profitable. Proceeding onward westerly from the Prince of Wales we pass over timbered spurs into marshy flats again, and reach the sections adjoining known as Campbell's claim, or the Independent Company. It is 15 miles from the port; the workings are in the bed of a creek; the tin is fine, the wash variable, the stripping running from 4 to 5 ft., seven men with one sluice-box turn out about 12 cwt. of tin ore per week. The adjoining sections west also belong to the Campbell's, and is called the Inexhaustible. The workings is about one mile distant from the Independent over lightly timbered rises and flats. It is let on tribute, and in all there are seven men employed with one box. This claim has a fair supply of water from a creek coming off the mountain. They have worked out about four chains, the wash being very variable in character, with from 3 ft. to 4 ft. of stripping on about 1 ft. of wash-dirt; the average yield of ore per week is about 10 cwt., but the tributaries intend to start another sluice-box shortly. North and adjoining this claim on an extensive marshy flat running close to the mountain are Dally's four sections, held by the Star of Hope Company, where some Chinamen are employed, proceeds very similar to the works belonging to the company mentioned above. One mile from here a little north-west lies the Clifton Company's claim close on the foot of Mount Cameron, the track passing over low peppermint ranges on to an almost treeless flat which runs nearly to the western end of the mount. They commenced working upon a gently sloping spur of the mount. The hydraulic sluicing is introduced here, the success of which remains to be proved. Considering the small amount of tin that can be obtained from a creek or face, and the amount of cost, it is a question if this process will ever be used to any extent in this district. Adjoining the Clifton Company several sections have been applied for by Brooks, Sadler, and others, but from this to the western end of the mount no ground is taken up. Returning now to the Tribute Company's claim, and passing from thence over a large hill strewn with granite boulders, we come to the workings of the Mount Cameron Ruby Flat Company, one mile south-east from the Tribute, the interval being vacant ground. This company has over 30 men employed, and holds two sections here, the lower one fronting on to the Ringarooma river. They also have three other sections some distance away in a northerly direction, on which no work has been done yet. The workings are in Smith's Creek, the largest creek in the whole district, which rises near a peak towards the western end of the Mount, is a permanent stream, and drains several miles of flat country. The company commenced operations by building a dam and cutting races, which is in places 8 ft. deep and 10 ft. wide, to turn the creek, at a cost of some hundreds of pounds. The first face or slope of wash was in a lagoon. In this, the upper section, the erection of a dam took the water off from about four acres of flat ground carrying wash on the surface, but very patchy. Two boxes have been at work here, but only one box and seven men are now employed. Below the first workings the stripping is about 8 ft. in depth, and the wash from 1 to 2 ft. No. 2 workings is about 100 yards below, easterly towards the river. Here is a second dam and race, with seven men and one box at work. Preparations are making to start a second box and set of men. The stripping varies from 5 ft. to 7 ft. This is considered the richest flat opened in this district, and will, no doubt, turn out about 15 cwt. a week from one box when in full work. The other can only be worked at flood time, which hinders the working of the first one. Owing to the flat nature of the ground a great deal of water accumulates in the workings. It is intended to erect an undershot water-wheel 7 ft. in diameter, to work one of Coma's patent lift chain-pumps, to keep the workings dry. No. 3 working in the second section, not far from the river, is a third dam and race. A very heavy tail to the river had to be cut, 250 yards long, 8 ft. deep, and 8 ft. wide, to take off the water from the workings. This face has seven men and one box at work. This and No. 1 box will yield nearly 15 cwt. of tin ore per week. On the north side these workings are all bounded by a granite hill. Close to the camp in No. 1 section there is a face working over 20 feet wide, the stripping just there being only from 3 to 4 ft. in depth, from which good prospects have been obtained from 2 ft. of wash dirt. Taking the whole depth of dirt to be removed it will yield about 17 lbs. of tin ore per ton of wash dirt. In different parts of this claim fine gold is found in the wash. Some efforts to save it have been made during the last few months by means of a blanket in the sluice box. Half-a-mile from this to the south-east, and adjoining the Mount Cameron Ruby Company's ground, are two sections held by the Victoria Company. The workings are in a blind gully, where two dams have been erected. The wash runs from 1 to 4 ft., and is very patchy, with a stripping on the top varying from 5 to 7 ft.; water scarce, but six men and one box turn out about 12 cwt. of tin ore per week. This is the last claim on this side of the river, and from here upwards there is no ground taken up on the west side of the Ringarooma river. The rate of cartage from the claims at the back of the Mount to the port is 5/ per ton, and 1/ per ton freight to Launceston, besides wharfage and agency commission, which have to be paid by all parties sending tin ore to market. Labourers' wages range from 7s. 6d. to 9s. per day of eight hours.

On the northern face of Mount Cameron there are no sections taken up that I could discover. On the east side of the Ringarooma river the deposits of tin are in flats, and very patchy and variable in character. Crossing the river at the ford, a short distance above Smith's Hotel, the road, which is lengthened by bends of the river, passes over the same kind of marshy flats and lightly timbered rises, as on the western side, and nearly ten miles by road from the port close to the river is the first section—that of Chugg, Rose, and party. Not much work has been done; the character of the wash and depth of stripping is very similar to the opposite side—on all claims on this side the supply of water is very limited. Two and a half miles higher up is a section held by Murray and Kennedy. They have been working with two men, but were stopped for want of water, so they have put a dam across the creek some distance up, and cut a race 500 yards long to the workings, where some wash has been opened on a hill side carrying tin. At the point of starting the stripping is about 4 ft. deep, but gradually deepens to nearly 20 ft. as the hill rises. Adjoining this section higher up are four sections known as Moore's, or the Eureka Company. The tin obtained here is coarse and nuggety. A great deal of dead work has been done here for a work of this kind. About 30 men are employed, the majority being at work on a dam which is estimated to hold 15,000,000 gallons of water when full. This estimate is considerably in excess of the actual contents. A race one mile in length has also been cut, and several tons of tin raised; the prospects of this claim are favourable, unless the bottom crops up, as it does in most places, and de-

stroys the slope of dirt. South of the Eureka further up the river are two sections applied for by Hudson and Grubb, on which work was carried on for a short time, and some 15 cwt. of tin ore raised, but is now abandoned. A gap of four miles then occurs before the next section is reached—one held by Porter, Swift, and party; this is also abandoned. Here another gap of five miles intervenes between this and three sections held by the Garibaldi Company. This claim is one mile east of the Ringarooma river, over which a wire-rope has been fixed, on which the ore and stores are passed from one side to the other. The wash dirt is very patchy tin, fine, and mixed with a large quantity of zircon sand. About three quarters of a mile further up the river is a section, held by Bradshaw and McIntyre, called the Gladstone Company, where 2 cwt. of tin was raised, but is now abandoned. One mile south of the Garibaldi, and the same distance from the river, is a section owned by Turner, Farrelly, Westwood, and others. Operations were commenced here with five men and one box, and nearly two tons of tin raised. The claims of Brooks and party, near the junction of the Thomas and Ringarooma rivers, is three miles south of the first claim, and three and a half miles inland from the Garibaldi Company. In a south-easterly direction is a claim held by Watson Brothers, who are working in a creek falling into the Blue river. This concludes the list of claims on this side of the Ringarooma river in the Mount Cameron district, but I believe five sections have recently been applied for at the head of the Great Mussel Roe river, which rises in the spurs at the northern end of the Blue Tier.

We will now return to the western end of Mount Cameron, south of which, one mile distant on a low range, are four sections held by the Boobyalla Prospecting Association. Operations were carried on here for several months; a very small patch of tin ore was found in a creek on one section, but not enough to effect a sale. This company like a number of others in this colony, got the lode fever, and spent a good many pounds in the search, which ended like all others in disappointment. Nearly south-west of Mount Cameron, and eleven miles distant, is Mount Horror, and on it several sections have been taken up. Only one is worked—that of Mr. J. Summers, situated on the south-eastern end of the mount. The wash-dirt and stripping is similar to that on the claims in the vicinity of Mount Cameron; the tin is fine, and Mr. Summers has four men and one box at work, from which 2 tons 16 cwt. 2 qrs. 18 lbs. of tin have been obtained.

The tin producing district of Mount Cameron may be roughly stated to be about 25 miles from Mount Horror to the eastern side of the Ringarooma, and 15 miles from north to south. The tin deposits on this area are very scattered and patchy in character; the tin wash-dirt is so small when considered in connection with the heavy stripping, and the difficulty of obtaining water in sufficient quantities makes the successful working of these deposits impossible; consequently many parties have stopped working. Many sections taken up lie untouched, and a great deal of ground is vacant from these causes, and from what I can see is likely to remain so, with few exceptions, and in no case that has come under my notice can it be worked at a profit, except by parties of four or five men on the co-operative principle, which means the owners to do all the work and spare the returns, and then only a small portion in the Mount Cameron district will pay to work.

It does not follow that a party holding a number of 80-acre sections has as many acres of tin producing ground. The general rule is that if tin ore is found in a section the deposit is in a narrow creek, from 10 to 100 ft. wide, varying in length from 1 to 4 chains, with a few exceptions of 8 to 10 chains, and of a very uncertain depth. Many of these creeks are worked out by four or six men in a few months. To account for the number of sections mentioned, as soon as tin is discovered in any part of the colony and it becomes known a rush is made on the Land Office at once, with applications for sections in all directions for miles. The result is that by far the greater number of sections are without tin, or even creeks, with not a few on the top of high sandstone hills or barren rocky peaks. This concludes a description of the tin fields in the east and north-east districts of Tasmania, with a few exceptions. There now only remains to be given an account of the north-west coast, of which Mount Bischoff is the centre, and is, in fact, the richest in all the Australian colonies, with the returns of the different claims that have been or are now at work in this colony.

[To be continued.]

MINING IN COLORADO—THE SAN JUAN SILVER MINES.

SIR,—In my last letter, which appeared in the Journal of Sept. 15, I promised to give some account of the Mount Sneffels district, beyond doubt the richest in this wonderful rich portion of Colorado. In perusing letters of this kind I always imagine that the reader says to himself "What does this man want? Has he an axe to grind." Of course, we all have axes to grind, and so have I, only I do not care particularly whether it is ground now or in five years hence. In writing these letters I am actuated more by a desire to tell my countrymen who have hitherto been so invariably "taken in and done for" in American mines, of the inexhaustible riches that are here lying waste for want of capital, and by reason of the comparative inaccessibility of the *locale*. You may say "Why do not the Americans themselves go into it?" Simply because in the eastern cities of the Union they will not believe our stories of silver and gold any more than you will, for one reason, and for another, because in America there is no idle capital as in England. Every one who has money has it employed, and it is too far away from New York and the larger cities of the Eastern States for anyone to come here to see; they cannot spare the time.

Now, as to the "axe" what do we want? We do not want anyone to come here to buy our mines; we do not want promoters to float companies to work them, not much! Mills are what we want—smelt mills and lixiviation works, but smelt mills above all. If a man has a good mine here now and sells it, it is simply because he is too lazy to work it, or because he is a lunatic, for the prices at which well developed and well known mines have been sold this season have been incomprehensibly and ridiculously low. For instance, the owners of a half interest in the Wheel of Fortune (the average mill run of whose first, second, and third class ore this summer has been 225 ozs. to the ton of 2000 lbs.) sold out the other day for 6000/; the mine has paid from the first shot fired. I tried to find out the reason, and could only hear that the owners did not agree, and the vendors were "tired of this sort of life," "did not want to stay in another winter," "wanted to go back East," one wanted to get married, another wanted something else, &c. As to getting any of our property in the hands of promoters, that is the last thing we want; I have seen too much of it in Northern Colorado. The English company generally pays about ten times the sum the mine could be purchased for from the real owners if they sent a shrewd and reliable man to treat with them; then they go into all sorts of useless extravagances, such as tramways, fine buildings, &c. The president of the company sends out to manage the concern some poor relative who knows as much about a mine as a pig does of waistcoat pockets, and who generally runs the whole business clean into the ground the first year, and then the shareholders are told the Americans have swindled them. No! Individuals are what we want; miners or smelters of capital and experience who will come here themselves and see.

My partner (also a Britisher) and I came in here, looked at the mines and looked at the lodes, which you can here see crossing the mountain tops in every direction, found rich mineral, good pasture for our animals, splendid pine timber, streams innumerable, good mill facilities, and determined at once to "stick in our stakes in the Imogene Basin." This we have done, and I now write from our snug log cabin, well stocked with "grub," plenty of warm clothes and blankets, and powder and fuse, fully prepared to stand a seven months' siege from old Hyems. We have got more lodes than we can work, and the mouth of our tunnel on the richest not many yards from the cabin door. Having brought in a drum furnace and complete assay outfit, I know what I am about, and it is quite sufficient to say that the ore we are taking out will pay us a comfortable margin, even if we have to park it on animals to the nearest smelter (25 miles) at a cost of \$20 per ton, paying \$60 per ton for milling 600-ozs. ore, and reckoning cost of producing at \$15

per ton. Now, to give you an idea of how badly mills are wanted, in this basin and the next one there are 13 mines being worked this winter, and the probable output of ore on the dump by July 1 prox. will be 1000 tons (a very low estimate). The average yield of this ore will be 150 ozs. silver to the ton. The nearest smelt mill is in the village of Ouray, capacity 10 tons per diem, but the owners have mines of their own which keep them fully supplied with ore. The ore must, therefore, be packed to Lake City, a distance of 36 miles by trail, or 110 by road, at a cost of \$45 per ton, and where they get \$60 for 100-ozs. ore, and others in proportion; or it must be packed at Silverton (20 miles), where the smelter pays \$42 for 100-ozs. ore. In addition to these mines being worked, there are within a radius of 4 miles of this cabin upwards of 150 rich claims, which are only having the yearly assessment done on them because there is no mill near by where they can take their ore. As I said before, the best proof of the want of mills is the fact that 100-ozs. ore is here rated low-grade, and not saleable at this writing. The ores of this district are essentially adapted for smelting, principally galena carrying grey copper, which latter all through this district is extremely rich in silver; a small proportion is very rich in ruby and brittle silver.

Next, what are the facilities for a smelter? At the foot of this basin, below and in the centre of all the mines, at the junction of Imogene Creek from this basin, and the Sneffels Creek from the Virginian Basin adjoining, there is one of the prettiest mill sites I ever saw—splendid water-power for saw-mill, 500 acres of pine timber (and more if wanted) to saw, and enough besides to run a 30-ton capacity mill on charcoal for 20 years if coking coal did not exist, which it does a few miles below Ouray. Machinery can be brought by wagon-road from the end of the railway to Ouray; from there it would be necessary to build a road to the mill site (6 miles), which can be done at a cost of 1000/., and I believe, judging from the reputed cost of what mills have been erected in this country, that a smelter can be put in here at a cost of 1000/ per ton capacity. The district is particularly adapted for tunnel work, the mountain sides steep, and nearly all the drifts are made on the veins instead of being cross-cuts.

I know half-a-dozen of my late fellow-students in the metallurgical laboratory of the Royal School of Mines, who have probably now taken their A.R.S.M., who should make a fortune here in from two to four years. Young fellows with grit and muscle, who ought not to be afraid of sledge and drill, and who could come here and find a claim or buy one for a few dollars and work it, instead of hanging about England looking for an appointment—i.e., working for someone else for a paltry hundred or two per annum—vice working for themselves and possible thousand. Doubtless there are many other ex R.S. miners, and if any of them see this and will write me I shall be happy to give them what information I can (gratis of course), and tell them no lies. A friend of mine writing from England says—"Your seven months winter a terrible weight to carry." My partner and I do not find it so; with that greatest of God's blessings—good health, plenty of "grub" and fuel, books, drawing, writing, assay furnace, any amount of fur to trap, and a tunnel to work in, we find the time pass rapidly and enjoyably, although we are at an altitude of 10,800 ft. above sea level. During the past six weeks the thermometer has ranged from 10° to 20° below freezing at daybreak, and 28° to 36° by noon each day. The snow has come unusually early, upwards of 3 ft. having already fallen, but if we want to travel about we use Norwegian snowshoes, and go anywhere with ease. Doubtless the capitalist who reads this will say "This man has got some mines, and of course he wants a smelter near them." Precisely so, but as what we are working will keep us in "grub," powder, and fuse, we are in no particular hurry. The mill will come sooner or later, and in the meantime we are content to peg away and improve our property. But, perhaps, some of your readers may think it worth while to write and ask me a few questions, which I shall be most happy to answer, and then if he thinks it worth while to come and see for himself he will not regret it.—*Ouray P.O., Colorado, Nov. 20.* W. WESTON.

GOLD IN BRITISH COLUMBIA.

SIR,—I have observed with some interest, though without surprise, the announcement by the mail from British Columbia of what is called the Discovery of Gold in the Cariboo District of that Territory. To me this intelligence is nothing new, having been familiar with the fact of that region being largely auriferous for many years past, and I have long been looking for the public recognition of it; and a great movement being made in the gold seeking there, it may be that the new proof of it may be the trumpet call for a new era in the development of this rich and important, though little known, province of our trans-Atlantic dominions. I feel myself warranted, as an old practical geologist, in pronouncing what has long been my profound conviction—that the Cariboo district and the mountains forming its northern boundary will ere long be recognised as the richest and largest gold-producing district yet discovered. I believe that this province of British Columbia is yet destined from its hidden wealth to more than rival the wonders which have been from the like sources in Victoria, New South Wales, and California.

It may be useful for me to state the reasons which have brought me to the conclusions I have arrived at from some special experiences connected with gold workings. I have been throughout a long life a practical geologist. That study has been the passion of my life, and perhaps I had a natural instinct in that direction. It happened to me in the year 1828 to be in Sydney, and there I headed an expedition far into the interior, and discovered and brought back to Sydney a considerable quantity of native gold in flakes, scales, and granulated particles. My friends could not deny the fact of my specimens being pure gold; but when I wished to organise another expedition to continue the search, and thought of inducing other adventurous spirits to join me, my friends interposed with a high hand, and announced to me seriously that if I should follow out such delusions they would feel it their duty to have me locked up in Parramatta Lunatic Asylum. With this prospect before me I reluctantly abandoned the idea. Had I been in England when the existence of gold there was so well established I should certainly have put forward my claim as the first discoverer, as I really was. I was not prevented afterwards from prosecuting my adventures to the north of Sydney in the then unknown regions, and there I made the discovery of a new coal field west of Newcastle, and traced the deposit for 12 miles. I took up a grant there, and proposed working the coal, but on applying to Governor Darling I was peremptorily prohibited by him from so doing.

These experiences in New South Wales were enough for me, and I left the colony. Some years after I proceeded to California, commencing the study of that interesting country, which I soon found to be an entirely new chapter in geological science. The gold washings in the rivers were just then making California famous throughout the world, and I began the study of gold mining. It soon occurred to me that this gold dust and gold flakes in the rivers had an origin other than in the river beds, and that there must be of necessity a matrix from whence this metal was derived. I pursued this idea. I went up the country towards the sources of these rivers, where the detritus and disintegrated rocks furnished the sands and material for the river beds, and in due time I came back to San Francisco with many fine specimens of quartz rock, thoroughly solving the question my mind had raised. I had the pleasure of submitting my specimens of gold in quartz to the late Sir Roderick Murchison, which interested that able gentleman extremely, but unfortunately displaced his then recently published theories that gold was alone found in auriferous sands, and I believe that he never forgave me for it.

I afterwards spent some years in the careful study and actual survey of those two grand ranges of mountains traversing North America from north to south—the Sierras and Rocky Mountains—and I soon found that all experiences of European geology were at fault there. All was new in principle and practice, and necessitated a new study from first principles, requiring patient, laborious, and continuous personal study on the spot to arrive at any correct knowledge of that interesting country. I have often reflected how little blame was really attachable to English mineral surveyors, sent out hurriedly to inspect and report on Californian mining properties

when mistakes were made. How could it be otherwise? I remember meeting one of these gentlemen, of really high geological attainments, who had with him a heavy box, on which he set the greatest store, containing a complete set of standard works on European geology, which he diligently studied every evening, only to complete the perplexity of his mind after his day's exploration. He consulted me on the subject, and I told him emphatically that if he expected to get on in California he should at once throw the key of the box into the river, and send the box back to England, trusting alone to hard observation and such geological instincts as he possessed. Thus it was that I traversed these mountains month after month, year after year, full as they are of metallic wealth, studying their characteristics, which were both novel and unprecedented.

It is more than 20 years since my attention was called to the mineral formations and deposits of British Columbia, from which colony were brought to me samples of the most undoubted richness both of the matrix and of native gold found in various diggings on the banks of the Upper Fraser river. The flake gold was the largest and most brilliant I had ever seen, and of great purity of quality, the only associated metal being a small quantity of silver. It is a well-known fact that the mineral deposits are always much larger at the junction of several lodes. I know that in the mountain ranges of America richer minerals are found where spurs and branches of the same ranges meet, and thus I argue that it will inevitably be found that where these too vastly metalliferous ranges of mountains come together, and become one single range, there, at the point of junction, will assuredly be found an enormous agglomeration of metal of some kind, perhaps several, but my miners who were there in 1863 found it to be gold in the richest abundance.

On looking at the best Atlases it will be seen that such junction of the Sierras and Rocky Mountains takes place in British Columbia, just north of the Cariboo district; and this locality, I venture to pronounce, will prove the one grand gold deposit of the known world. It will be worked yet before a long time elapses, and it would be an idle prophecy to predict that before this century shall have run out New Westminster, receiving a new vitality from the riches of this district, may begin to rival Melbourne, Sydney, and San Francisco in their wealth and magnificence.

It is not surprising that nothing has hitherto been done in Cariboo. Besides the existence of gold and even of skilled miners, other things are equally necessary—food and means of transit. All must work together. My own people told me that they made good piles, as they called it, but they stayed out the winter there and could only get supplies from a few Jew traders, who very feelingly proportioned their charges for the common necessities of life to the exact amount of gold their customers had collected, and they found themselves penniless after months of toil, though they had solved a great question, and did not know how to use it.

It seems to me that the local Government ought to move in this matter, to this extent at least, to send up to the Government expense (and it would only cost, say, from 3000l. to 4000l.) a small expedition of competent persons to survey and report on the country in this special feature. This would take (say) 12 or 18 months, then according to circumstances Government should organise a proper system for working it, and if the report should be quite favourable the Government would do well to organise conveyance, escort, and food on suitable remunerative terms. In this way the miners would be attracted in any numbers, and no disappointment would accrue, and the entire work could be systematised from the beginning.

There really would be no insuperable difficulties, as that grand river, the Fraser, is full not only of gold in its sands, but of countless millions of salmon, on which the natives subsist almost entirely. It takes its rise in the very heart of the Rocky Mountains, at their junction with the Sierras, and is navigable for a long distance with the help of a few portages here and there, and a few stations established from point to point up to the selected locality would soon set the whole business in practical train.

Depend upon it there is a great future yet before British Columbia, with a healthful climate, enormous forests, and productive soil, with internal water communication. Still I incline to think the one thing yet useful is the North Pacific Railway to connect it with Canada, and with us by a short route, might even yet be accomplished by adequate vigour, with the millions of wealth in gold which British Columbia itself possesses, now lying unproductive for want of due searching for, and practical organisation to bring to market.

30, Grove-lane, Camberwell, Jan. 7.

JACKSON BARWISE.

THE FLAGSTAFF MINING COMPANY.

SIR,—I addressed to you, under date of the 11th inst., a lengthy communication, in re Flagstaff Mining Company [inserted in last week's Journal], which in the interest of the 700 or 800 shareholders residing in Great Britain you may deem it advisable to publish wholly or in part. I have from time to time forwarded to you the Salt Lake Daily Tribune, in which have been published my letters in reply to Judge McBride's, and also other communications from me having reference to the affairs of the Flagstaff Mining Company, which, if you have had the time and patience to read, will have given you a pretty good idea of the situation of matters here, and supplemented by my letter of the 11th, above referred to, will place you in possession of the latest information. Nothing can be more disingenuous than the conduct of the members of the existing board of directors in London—Mr. Harvey (Chairman), Ellis Pearson, and M. C. Vincent (directors)—not only in withholding information from the shareholders, but also in publishing circulars which are false in respect of most of the material statements therein made. This habit of misrepresentation and concealment has characterised the whole course of administration of the present board from the beginning of their official career. They withheld from the shareholders the fact of the existence of the lease and smelting contract granted to Hunter, under date Nov. 24, 1876, even up to the time of holding the regular annual meeting of the company, on April 30, 1877; and on the occasion of that meeting Mr. Harvey (the Chairman) substantially denied that they had been granted, and only spoke of Mr. Hunter as the manager of the company. Also in the circular letter of the directors addressed to the shareholders, under date May 9, 1877, soliciting subscriptions or applications for debentures to be issued by the company, Mr. Hunter was referred to as "the agent" of the company, and all allusions to the Hunter lease and smelting contracts were withheld, for they knew very well that if their existence were to be made known no one would have entertained for a moment the idea of investing in the debentures; and besides suppressing these vital facts, other statements were positively asserted that were without foundation in truth. The allusion to the purchase of the South Star and Titus Mines or claim, and for which alleged purpose the proceeds of the debentures in question were to be used in part, was wholly apocryphal, and of the 20,000l. more or less, so issued from the office in London not 1l. of the proceeds has been used for the purpose of the purchase of those mines, or for paying any portion of the floating debt standing against the company out here. The subscribers to these debentures have, therefore, been misled in respect of essential facts; and besides the legality of the mortgage deed made by Hunter in December, 1876, by virtue of his quasi powers as "attorney in fact" of the company, and which furnishes the security for these debentures, is most seriously questioned, and will, no doubt, be so declared by the Federal Court here; and nobody was better apprised of the questionable nature of Hunter's authority in the premises than Harvey and Pearson, for in addition to their own knowledge of the principles of law (they both claim to be barristers), they had placed before them the opinions of eminent lawyers both in England and America on the subject. In the circular letter of the directors to the shareholders, under date of Sept. 26, 1877, the following paragraph occurs:—

"They (the directors) have acquired the title to the adjoining mines, the South Star and Titus, the acquisition of which property the board recommended and the shareholders approved at the last general meeting. This important and, indeed, essential addition to the property has been effected at the moderate cost of 10,500l. The purchase money has been provided under the contracts made by the directors, save the sum of 4000l., which, however, has been temporarily advanced, giving the shareholders nearly four months within which to subscribe that amount on the debentures of the company. The directors think it impossible to exaggerate the value of this purchase, and considering the rate of interest in Utah—18 per cent. per annum—they strongly recommend this matter to the prompt attention of the

shareholders, whom they invite to make personal enquiry on the subject at the company's offices."

Now, the facts of the case are shortly as follows:—Mr. Ellis Pearson when here in July last loaned Mr. Fredrick W. Billing, to whom A. G. Hunter had transferred his quasi lease (to which I have referred above) the sum of 4000l. on six months' time, at the rate of 1½ per cent. interest per month—18 per cent. per annum,—and Pearson also received in hand a bonus of 5 per cent.—say, 200l.—which items Billing was authorised by Pearson to charge to the account of the Flagstaff Company, to be repaid to Billing from the revenues of the mines. Pearson received from Hunter for security two promissory notes for 2000l. each, made jointly by himself and his brother Gustav Billing, with the condition attached that Billing should have the privilege of continuing said loan for another period of six months should he elect to do so, by giving Mr. Pearson one month's notice prior to the expiration of the first period, which will expire on Jan. 13, 1878. From the nature of Mr. Billing's circumstances, Mr. Pearson is anxious, no doubt, to realise his money, and hence his importunate appeal to the shareholders contained in the circular letter of Sept. 26, 1877, from which I have quoted above. The motive of Mr. Pearson's urgent appeal will from the above explanation appear most obvious.

The Flagstaff Company has never acquired any title to the South Star and Titus Mines. Hunter purchased an undivided one-quarter interest in his own name for about 6000l., and which he transferred to Billing, and which they hold jointly as co-partners against and not for the Flagstaff Company, although the money used by Hunter in the said purchase was derived from the revenues of the Flagstaff Mine. And recently a suit between the parties claiming under the South Star and Titus patents and the Flagstaff Company has been tried in the U.S. District Court, held in this city, and a verdict rendered by the jury against the latter company for \$45,000 damage; and should the same be carried into judgment it will operate as an estoppel against the company to allege title to the part of the vein heretofore in dispute between it and the owners of said South Star and Titus Mines.

All the other material statements contained in the address of Sept. 26, 1877, are susceptible of similar refutation to the above, and the facts in refutation are fully set forth in my communication of the 11th inst., heretofore referred to. The true interests of the shareholders in the present exigency of the affairs of the company consist in co-operating with their colleagues and the creditors of the company, who are instituting proceedings in the Courts here for an accounting, and for the appointment of a receiver to take charge of the affairs of the company until such time as it can bring the parties defendant to that condition, and to a restoration of their ill-gotten gains, when the rightful owners (the company) can be restored to the possession of their valuable property.

My services here are entirely at the disposal of the shareholders in connection with the business, and having placed in the hands of Mr. John W. Sykes, St. Swithin's-lane, the names of gentlemen in London to whom I can refer as to my eligibility, I would beg to refer you or any of your clients to Mr. Sykes for the same purpose. Salt Lake City, Utah, Dec. 15. LYCURGUS EDGERTON.

FLAGSTAFF MINING COMPANY.

SIR,—To anyone reading the letters in last week's Journal relating to Flagstaff it must be apparent in whose special interest they were written. Let it be borne in mind that no reply has yet been made to Prof. Vincent's circular of Dec. 15, with its array of startling charges. One is, therefore, not surprised to see an attempt made to drag down Messrs. Vincent and Garne from their seats at the board, and the letters in question were manifestly written with the view of influencing the shareholders to that end, but surely without avail, as the body of proprietors will in no case permit themselves to be hoodwinked as to who are their friends and who their enemies. What is wanted is not a sweeping change at the board, but simply a careful weeding out of those from its ranks who have proved themselves unworthy the confidence of the body of shareholders. Prof. Vincent has certainly put his record while on the board to the severest test, and he has, in my opinion, come out so completely satisfactory that probably 99 out of every 100 shareholders would not only gladly accord him a vote of thanks for the battling he has done on their behalf, but would express much dissatisfaction were he to seriously contemplate withdrawing from the board; and from the able manner in which he presided at the recent meeting of debenture-holders I should personally be glad to see Prof. Vincent in the chair of the Flagstaff Company. A DEBENTURE-HOLDER.

THE RICHMOND MINE.

SIR,—By the time the next dividend is due a sum of 100,000l. will be (accidents excepted) in the Richmond exchequer. Say that 20,000l. was thrown to the lawyers, &c., what is to be done with the odd 80,000l.? This question will soon be on the lips of some of us who are uncommonly short of the ready. Is it to be 7s. 6d., 10s., or 15s.? 40,000l. will pay us 15s. per share, and carry over 40,000l. This is a large sum, it is true, to divide in a quarterly dividend. But I do hope the policy of the board is somewhat more liberal than 7s. 6d. per share. NEEDY SHAREHOLDER.

MINING ENTERPRISE IN CALIFORNIA.

SIR,—Another instance of the capability of American mines to yield profits when properly worked is afforded by the Soulsby Mine, of which I subjoin a description, taken from the "Resources of California." Soulsbyville is a new camp eight miles above Sonora, at the location of the good Soulsby Mine. This place has grown up within a few months past to quite a village, of two stores, two hotels, two saloons, one meat market, a school, the teacher receiving \$75; and quite a settlement of families. The Soulsby Mine, through mismanagement, was abandoned some years ago, but Mr. John Leechman, superintendent, took hold of it, and is proving it to be one of the great mines of the mountains. He runs 15 stamps, has good improvements, works 60 to 70 men, has a shaft down 650 ft., and 1500 ft. from this another down 550 ft. The vein is 12 in. wide, and shows gold in much of the rock. It is among the richest we have seen. He has formed five levels; he uses two Ingersoll and two Darlington drills. The walls are granite. This mine is a great success, and promises well. He is also working the Louisiana Mine, one mile south-east, which shows good rock.

I may remark that previously to Mr. Leechman the property was worked by Messrs. W. and R. Johns, and it is to be regretted that they did not continue to develop it. I may also mention the Ferguson Mine, in Mariposa County, which was abandoned by British capitalists, and is now a very productive mine, with splendid results. It is being worked by a company from Sonora, in Tuolumne County. The English company has certainly lost a good property here.—San Francisco, Dec. 22. ENGLISHMAN.

THE NICKEL TRADE.

SIR,—Dec. 31, 1877, brings to its close a year so exceptional in the history of the nickel trade that we think a short sketch of its progress will be interesting and useful. For many years before the introduction of nickel coinage by the Germans nickel stood at from 4s. to 4s. 3d. per lb. About the commencement of the year 1873 the German Government decided to issue a nickel coinage, for which purpose large quantities of nickel were required, so much in excess of any previous demand that the price rose to 11s. and 12s., and for a short time even to 16s. per lb. This great rise in the price of nickel stimulated the production of the ore all over the world, so that at the end of the year 1876, when the German coinage contract was completed, the importations were largely in excess of requirements, consequently the country became glutted with ore, it was difficult to effect sales at any price, and nickel fell rapidly in value. Many of the new mines, however, which have been opened yield ores of so low percentage that they can only be worked at a profit when the price of nickel stands very high; consequently, several of them have already been closed, and others will have to follow. Still, the sources of supply have been so much developed that, in the event of more large coinage contracts being entered into the market

cannot possibly be so disturbed as it has been for the last few years. This being the position of the market we scarcely think that the price of nickel will fall much below the present point (4s. per lb.), unless trade become further depressed and the influx of ore beyond its normal demand should continue. If, however, there should arise any other exceptional call for it, similar to the German coinage contract, the price must be firmer. HENRY WIGGIN AND CO. Birmingham, Jan. 10.

NICKEL.

SIR,—Your correspondents are in error in supposing this metal can be smelted in a simple manner and at a cheap rate, in the same way that copper and tin are produced. Pure refined nickel is the only quality which commands a ready sale, and this cannot be produced by a smelting operation only, but involves complicated chemical processes, the cost of which alone necessitates a wide margin between the price paid for the metal contained in the ore and the price of the marketable refined nickel. But I fear that the margin taken by the refiners is much too wide, for at this time a ton of ore containing 10 per cent. of nickel would realise only about 20l. This ton of ore contains 2 cwt. of nickel, which at the present market price—4s. per lb.—is equal to a little over 44l. Thus, for an ore of that percentage the refiners pay only half the value of the contained metal. I have no doubt your calling public attention to these facts will have a beneficial result. A.

THE BLENDE TRADE.

SIR,—I noticed in last week's Journal the letter signed "A. B. C." on the above subject, and would add for the information of "A. B. C." that my experience, which lately has been pretty extensive in this particular market, does not coincide with his "anticipatory reply." For some time I have been a buyer for export, and which fact I have notified to all blende producers, besides advertising in your columns. Some of the mines who value competition in the interests of the proprietors send me regularly their samples for tender along with those sent to the various smelters, and I have from time to time been an extensive buyer. I believe, however, some of our smelters object to merchants competing; therefore some mines consequently do not submit samples—amongst others I believe may be mentioned Talargoch. Thus it will be seen ("if smelters have the rates in their own hands, and can easily combine to keep them down") the fault appears pretty much their own for not encouraging open competition. Liverpool, Jan. 9. GEORGE G. BLACKWELL.

ELECTRIC LIGHTING—No. VII.

"CANDLES" JABLOCHKOFF.

These candles have been fully described already (p. 1440, Dec. 29), so there is no need of reverting again to their constitution, only to call attention to their peculiarities as a medium for lighting by electricity, and their usefulness in practice. With one apparatus one or many more focuses of light can be obtained. It is only necessary, in order to obtain the result, to use "electric candles" of different dimensions. With only one focus a very strong and brilliant light is obtained, by far superior to that obtained from a "regulator" placed on an apparatus of equal force. When several focuses are disposed on the same circuit the total strength of the current is equally distributed between them. Generally speaking, on every circuit four focuses are adapted, each giving an amount of light equal to 50 gas burners.

AUTOMATIC IGNITION.

As soon as the "inductor" of the apparatus is turned so as to shut off the circuit, the ignition of the "candle" takes place spontaneously by a very simple contrivance. A little plumbago pencil of ½ line in diameter, and 6 lines in length, is placed over the top end of the candle in a longitudinal position, and there secured by a small piece of asbestos paper. The current ascends through it, volatilises it, and produces an instant ignition of the "candle." To have the carbons composing the candles to be consuming in equal length they must be made of different size, the one corresponding with the positive current being double the other. With alternate currents the two carbons have the same diameter, because they then shorten equally by combustion. It has also been stated above, when describing the regulators, that it was necessary a special man should replace every three hours, by a fresh one with new carbons ready fixed, that one which had its pencils consumed; but with the aid of what may be called a "multiplying chandelier," and these "candles," this drawback is no longer existing. The "electric candles" system Jablochkoff last from two to three hours, and by a very simple contrivance at the moment the first "candle" is at an end the next one in order does spontaneously get ignited without any appreciable interruption of the light. The mechanism is so arranged that as many candles as required can be put on the chandelier; the lighting can, therefore, be carried out positively at will. This was absolutely required for the lighting of public streets.

By this system a light is obtained which can be compared to a splendid moonshine on a clear night, the light being nearly equal to daytime. It also possesses the following qualities:—

- 1.—It is not glaring like that given out by the regulator; nay, its merits are not to resemble it at all.
- 2.—The "electric candle" light does not vary, and instead of emitting a strongly luminous spot radiating disagreeably all round, as per a regulator produced, the rays are drowned at the end of the carbons in a white flame, radiating forth an easily diffusible light. Thus the brilliancy of the focus of a candle is always easily supported by the naked eye, whereas that of the voltaic arc of a regulator cannot.

3.—The flame rounds the shadows and decreases their intensity. It is preferable in drawing-rooms and offices to use opaque globes.

4.—The great superiority of the light given by the electric candle over that of a regulator consists in a complete steadiness.

This fact only implies such a difference between the two systems that now by use of the candle electric lighting is applicable wherever gas is; whereas with a regulator no such result is possible.

ADVANTAGES OF ELECTRIC LIGHT OVER GAS.

- 1.—The light given by the electric candles preserves their natural colours to all objects and substances, a great advantage in dye-works, calico-printing works, or in show-rooms, stationers' warehouses, &c., where choice or sorting, regularity of designs, &c., are based on colours.
- 2.—The gases which with gas blacken walls, pictures, and ornaments, are completely, of course, suppressed.
- 3.—The inconvenience of heat resulting from the consumption of a great quantity of gas in a closed room completely disappears. Thus an electric light giving more lighting power than 60 burners does not give more heat than that resulting from the consumption of a sperm candle.
- 4.—All dangers of explosion and fire arising out of the use of gas also completely disappear.

COMPARATIVE COST OF GAS AND ELECTRIC LIGHTING.

In comparing the relative cost of the two systems great care has always been taken by the critics of electric lighting to leave on one side the primary expenses necessarily incurred for the use of gas, such as pipes, meters, burners, and chandeliers, which not only cost largely in the first instance, but continue to cost for keeping in good order. Gas, in fact, costs:—1. The number of cubic feet burnt; 2. The interest of capital spent on fittings; 3. The repairs always wanted. In manufacturing premises only commonly lit this cannot be far less than 2l. per burner a year; whereas in more sumptuously lighted premises it must come to a great deal more. Most undoubtedly the adoption of electric lighting in large manufacturing premises will always be cheaper than gas. It only remains to compare the daily cost of each.

First case.—Lighting factories, streets, &c. (employ of powerful focuses), for a light equal to 300 burners, per hour:—

Coal for boiler, 2½-horse power	0s. 2d.
Wages of stoker	0 4
One-third of a "candle" costing 1s.	0 4
Total	0s. 10½d.

When the motive power is common to other machinery the cost sinks down to 4d.
 With two focuses—coal and stoker 0s. 6½d.
 3½ds of a candle lasting 2½ hours, and costing
 8½d. per hour 0 6

Total 1s. 0½d.
 Same remark as above for stoker and coals.
 Second case.—Sumptuous lighting of show-rooms, theatres, music and dancing halls, &c., per hour, for light equal to 300 burners:—
 Coals 0s. 2½d.
 Wages of stoker 0 4½
 4 electric candles lasting 2 hours each and costing 7d. per hour each 1 2

Total 1s. 8½d.
 Similar remark as to motive power and stoker.
 In both cases the lighting with gas would cost—
 300 × 3½ cubic feet × 3s. 9d. = 4s. 1½d.
 Of course, the more the light costs per 1000 cubic feet the more marked is the difference.—*Greenwich, Jan. 9.* A. VASSARD.

OPINIONS OF PUBLIC MEN.

Report of M. L. REYNOLD, Administration of Ways and Bridges—Lighthouses Division.

My opinion being asked on the efficacy of electric light produced by the magneto-electric apparatus Nolle-Van Maldere, for my department, I hasten to say it is entirely favourable. A first apparatus having been tested and perfected at the Pharos general depot, I did not hesitate to recommend to the Government a trial of this system on one of our first class lighthouses with fixed lights, choosing that of the Heve, on account of its proximity to Havre, where in case of breakdown or difficulties many competent engineers to either repair or superintend could be found, and also because there being two fires the two systems could be practically tested together. After a few hitches, always happening at a beginning, the light has given entire satisfaction, and immediately afterwards the apparatus was applied to the two Pharos, to the great delight of the navigators. Experience having proved that there was no risk of breaking down, an apparatus was fitted up at Cape Gris-Nez, where the light is in "flashes," or at "eclipse," and where there is no means of finding competent engineers. It was put there in 1869, and has never failed since. All navigators speak highly of it, and are very well satisfied with the increase of light, and the consequent extra distance it reaches. It is one of the most important on our shores. The electric light would be more generally adopted were it not that the funds put at the disposal of my department precludes the idea of replacing the old system by it, because at present their works are thought more important. (Signed) L. REYNOLD.

Extract of a note addressed by M. l'Admiral POTHEAU, Minister of Marine under M. THIERS.

It is of very great importance for the naval service that use should be made of the magneto-electric apparatus. What is known of its properties warrants sufficiently its commendations, but it is not doubtful that by its practical employment many more qualities may be discovered. *Prima facie*, the criticisms directed against it are easily answered—the light is reproached as being too brilliant; but is that a drawback at night? Would it not be like reproaching the sun with possessing too strong rays over the earth? It is evident that a new and powerful means of light has been found, and that it is not yet put to its proper use. Resuming, I do not hesitate not only to recommend it, but I do consider that it would be much to be regretted that, after seeing it in operation, our navy should not immediately be provided with it.

Extract from a letter of Vice-Admiral LA RONCIERE-LE NOURY.
 Sir,—I have received your two last letters. I persist, you know, in believing that the electric light has become a necessity on the sea. Its cost, and the room the apparatus occupies may not prevent its being adopted on every vessel. But the large mail-steamer which go at a high rate of speed, and of which the evolutions are so slow, would only gain by having magneto-electric apparatus on board. You know I was instrumental in having one apparatus put on board the yacht of Prince Napoleon. Before the war one or two men-of-war were fitted with it, and the reports exceedingly favourable. Myself I shall never refrain from insisting on its utility, but it must not be lost sight of that the Government cannot very properly impose it.—*Paris, Nov. 25, 1874.* (Signed) LA RONCIERE-LE NOURY, Vice-Admiral.

COMMERCE AND MINING—THE NORWICH UNION FIRE INSURANCE, AND ROMAN GRAVELS MINE.

SIR,—The growth of the Norwich Union Fire Insurance Company has been continuous, momentous, and permanent, and at the present date exhibits strong evidence of expansion. The 30% share for the year 1875 received a dividend of 20%; 1876, 22% 10s.; and for the year 1877, 24%, or (say) 66, 75, and 83 per cent. per annum. The shares are 2200 in number, and of 250£ each, with 30£ called up. The working capital is 66,000£, and the liability 484,000£, or 220£ a share. The market value is 450£ a share, *cum* dividend, equal to 990,000£, or just 1400 per cent. per annum on the money paid up. Such is the confidence reposed in this institution that shares very rarely change hands, excepting under probate or other necessary and indispensable realisation. It will be seen at a glance that the dividends accrue on the 30% called up capital alone, that the excess in price is wholly premium, and in no way capitalised. This premium is in no sense represented by money or property, but is dependent entirely on the continuance of existing rates of dividends, and the future maintenance of their, at present, lucrative business, with the efficiency and solidity of the direction and their staff of officials. In fact, the shares represent 30% in paid up cash, the dividend 24% a year, while the public give a premium of 420% for its receipt and probable expansion hereafter. The liability of 220£ a share is regarded as purely nominal, though it must be remembered that in case of disaster, however remote or improbable the contingency, the risk will have to be encountered. This is an element in the constitution of the company that should be borne in mind. The purchase of ten shares involves the outlay of 4500£, with 2300£ liability in case of grief, for which the investor will get the dividend—*i.e.*, 240£, equal to 5½ per cent. on the 4500£ purchase-money.

There can be no question that the Roman Gravels has been a good, sound, and profitable mine. The preceding company to the one now in existence expended about 10,000£, and received back in dividends about the same amount. In the year 1871 the present company was formed upon the limited liability, with 8000£ working capital, and from that date profits rather exceeding 1000£ a month have continuously accrued up to this time, or (say) 84,900£ in the entirety. Now, this enterprise will compare for a period of seven years more favourably as regards interest than even the Norwich Union Fire Insurance, for the average dividends over the whole period has been no less than 150 per cent. per annum, and the mine now sells for more than 1000% per cent. premium on the capital actually expended on the works (8000£). There are, however, two phases in the creation and conduct of companies constituted upon the limited liability principle. There can be no doubt that Roman Gravels was, and is, a good mine, and no one can aver that a good mine and such an one as pay continuous dividends of 1000£ a month for a period of seven years is worth a premium, nor do we contend that in this case the vendors received too much (for the mine may yet pay another 90,000£ in dividends, and then remain a valuable property in prospective).

What we should like to see corrected or avoided is the capitalising of the purchase money with the working capital. In this company the former was 82,000£, and the latter 8000£. As a mine the dividends have been in about seven years 1150 per cent. on the capital, but as a limited company capitalised as 90,000£ the dividends have been only 94½ per cent. over the whole period. Had this company been constituted like the Norwich Union Fire Company the figures would stand as follows:—12,000 shares, 13s. 4d. paid, price 1100 per cent. premium, and dividend 1150 per cent. instead of as at present 12,000 shares, 7½ 10s. paid, dividend 7½ 1s. 6d., and price 8½ per share. Viewed in the first phase the Roman Gravels will appear (as it very justly is) a brilliant prize, yet as now quoted in your widely-spread Journal it is simply an ordinary adventure that has paid back about its outlay, marketable at par, and destitute of premium. In the character of a mine the Roman Gravels has proved an important prize; as a financial and capitalised company it is a very ordinary and tame affair. If such be the position of the Roman Gravels that has paid 1000£ per month for seven years, what must prove the issue of other companies that have not yet sold even a single parcel of ore, yet stand loaded and capitalised in 200, 300, and even 500 per cent. on the paid up working capital? Such abortions are fostered through circulars!

There are many good mines upon the *tapis*, and many others lying dormant for want of capital, still it must not be lost sight of that mining is an industry, like railways, shipping, building, engineering, and all other enterprises, requiring earnest, persevering, and practical supervision and economy to make both ends meet, and if every 10,000£ expended in the search for the earth's hidden stores be weighted with 10,000£ up to 30,000£ for the privilege of being ad-

mitted subscribers at what is usually characterised as "par," then mining, like every other industrial pursuit, will come to grief.

R. TREDINNICK,
 Consulting and Advising Mining Engineer.
 Exchange, 66, Coleman-street, London, Jan. 10.

INVESTMENTS.

SIR,—In a period of depression like the present, when everybody appears to be waiting for someone else to take the initiative in investment—more from the difficulty of not knowing what to do than from unwillingness to do it—it may, perhaps, be serviceable to supply some data which will give the necessary direction in this difficulty. Of course, it is as natural for an investor to expect a return on his purchases as it is for a farmer to look for an increase in the seed which he has sown. But there are certain considerations as to "time" which are quite as necessary to the one as to the other, and which the investor, unfortunately, is very apt to neglect. To pursue the simile which has been already employed, what would be thought of the farmer who commenced to plough his field when the frost had bound every clod together like iron, or who scattered his seed without any kind of preparation whatever in the soil to receive it. And so the man who wishes to profitably employ his capital will discover the most propitious seasons, as well as the most suitable investments, and will act accordingly. Now, it is a well understood principle among operators in stocks and shares that prices cannot indefinitely either fall or rise; after a severe fall there will come the almost inevitable reaction, which often carries prices to a higher level than they obtained before, and from which point also there may come a relapse to what may be termed normal prices. It becomes a matter of great importance, therefore, to know something of the history of the proposed investment, its fluctuations, &c., or to compare it with a similar class of stocks and shares if it has no history of its own; and this kind of investigation would amply reward the patience of those who would take the trouble to use it. But, speaking generally of the time to profitably employ capital, it seems to one accustomed to observe that the present opportunity is almost unparalleled. We have passed through two or three years of a most trying crisis, such as but few can remember to have seen equalled. Even sound securities have suffered very much, many others have been wiped out of existence, and many have reached so low a point as to be properly called ridiculous. Enterprises of great value are either nipped in the bud or held back in hope of better times, and it is not too much to say that many shares which but a few years ago would have been cheap at many pounds can now be obtained at shillings, and many with brilliant prospects before them, and which in ordinary times would have commanded a very high premium, find but few purchasers at par. Only a comparatively short time since and such a mine as the Hultfall, the equal in every respect to the great Van Mine, could no more have remained at the present low figure than a sovereign could become a drug at a shilling.

Feeling sure that it is only necessary to call the attention of the public to facts of this kind to ensure a response which will benefit the whole business world is my reason for troubling you with this letter, and, with your permission, I will send a few condensed particulars next week relating to the property already named.
Cornhill, Jan. 10. M. F. DORMER.

HOLMBUSH AND WHEAL NEWTON.

SIR,—An unfortunate misprint occurred in my letter published in last week's Journal. You have made me say—"In every case, without exception, I have found my 'shareholders' to be actuated by the basest motives," whereas I wrote thus—respecting my "slanderers." Kindly insert this correction in your next issue, as I do not wish it to be understood that I have to say aught respecting the shareholders of the company under my charge except in grateful recognition of the confidence and courtesy with which they have always treated me.
Brixton, Jan. 11. STEPHEN H. EMMENS.

GREAT WEST VAN.

SIR,—I cannot allow Mr. Thomas Gundry's letter of last week to pass by unnoticed, from which it would appear that my name, added as broker to the prospectus of this company, was instrumental in inducing applications for the shares, whereas I believe re-christening the Esqair-Lie Mine Great West Van, was the chief cause of the public becoming subscribers. Although my name appeared in the prospectus as broker, it was quite unauthorised by me, and I was only acquainted of the fact by the secretary on the eve of the prospectus being issued; but on being informed by the secretary that several influential gentlemen on the Stock Exchange would be largely interested in the company and its management, I allowed my name to remain—in fact, there is no doubt I had at the time great faith in the prospects of the company, or I should not have subscribed for 1000 shares. However, I can positively state that I never received a farthing commission from the company or from anyone else upon a single share. This, Sir, is the broker's side of the picture.

What of the directors and promoters? It is as follows:—I was invited to attend the allotment of shares, and to my surprise the distribution to the *bona fide* applicants was only 7000 out of the 25,000 shares, the remaining 18,000 being reserved as free shares for Messrs. Gundry, the secretary, the liquidator (Mr. H. Wilson), or their friends, besides receiving 4000£ in cash, possibly to free themselves from their former difficulties as Esqair-Lie shareholders. No wonder proxies were solicited by the secretary for the meetings, when the aforesaid fraternity would participate to the amount of 18,000£ in dividends on their free shares out of 2346£ 18s. dividend. The result of paying such dividends was that the capital subsequently became exhausted; preference shares were introduced, the capital on which (say, 2218£) likewise disappeared. The mine has only produced ore to the amount of 7368£ 13s. 7d., at an expenditure of 8836£ 19s. 6d., besides 8073£ 6s. 7d. for permanent works, machinery, and preliminary expenses.

Why this outlay? when the prospectus announced that "the company is formed for the purpose of purchasing the leases, machinery, plants, ores, &c., of the Great West Van Mines, which are completely provided with pumping, hauling, and ore dressing apparatus; and after paying for same the company will have an unexpended capital of 10,000£, which is considered amply sufficient to carry out all necessary work."

From the above it must be clear that the dividends were paid out of capital, and I earnestly protested against the proceedings of the directors at the time. It will be seen from the following letters which I wrote to the secretary, from the very first, I condemned that which I believed would ultimately bring ruin upon the company.

Mr. Gundry's statement that "no one wants this company wound-up" is strikingly at variance with the attempt made recently by himself and co-directors, as witness the petitions presented by them to the Court for that purpose, and the resolutions passed at the meeting of shareholders in opposition to the wish of myself and friends, I do not hesitate to say that, but for the action I have taken in the matter, the whole concern would have been closed up before now, and revived under another name by skilful manipulators.
75, Old Broad-street, Jan. 10. W. WARD.

DEAR SIR,—I beg to acknowledge the receipt of cheque, 25£ dividend, on account of my Great West Van shares, which, in my opinion, ought never to have been declared or paid by the directors in the present premature state of the company's affairs, inasmuch I consider that my subscribed capital is being endangered for the benefit of promoters' free shares. I firmly protest against their receiving the dividend in full, while I, as one of the subscribing shareholders, only get paid half. I must again request you to send me the receipts in full for my calls without further delay, as you have ample funds of mine in your hands. Hoping you will place this letter before the directors at their first meeting.
M. Greene, Esq., Gresham House.

DEAR SIR,—I have to thank you for your gratuitous offer of 313 Great West Van shares, which I shall only accept in trust—and not for the sake of being bought over—as you must be fully aware of my determination to expose any dishonest dealings towards the subscribing shareholders by tricky schemers.
M. Greene, Esq.

DEAR SIR,—Nothing surprised me more than to learn that the directors have thought proper to declare another dividend in this mine. Surely such proceedings cannot be honest to those shareholders who have subscribed in full. Did you place my letter of Sept. 25, 1873, before the directors as requested by me? If not I consider the promotion of this company as a deep scheme got up for the benefit of the

shipwrecked shareholders in Esqair-Lie Mine, and fatal results must hereafter follow. How is it I do not even get a cheque for my dividend? Please attend to same forthwith.—*M. Greene, Esq.* W. WARD.

CARDIGANSHIRE MINES.

SIR,—Your valued correspondent from this district, in speaking of the shallowness of some of the deposits, instances the Taliesin Mines as one of those which have failed in depth. To some extent this is no doubt true, but perhaps he is not aware that recent workings have led to the discovery of an old shaft almost in the bog, which on clearing out was found to be very rich, a course of ore being laid open upwards of 15 in. solid as to mineral, but consisting of lead and blende mixed. In my opinion the lodes, of which there are a very great number, have been disordered in the hill, but if found in the settled ground, which is at present almost untouched, I think great riches would be the result. But even taking the present workings, surely your correspondent cannot call them deep, as I do not think they are anywhere more than 20 fms. below edit. The great number of lodes crossing each other, and forming so many junctions on this property, renders this mine a very puzzling one to work. I am informed that large quantities of ore were obtained at a shallow depth, and, indeed, in some places as deep as the mine was worked; at all events I have great faith in the northern part of the mine, where the ground is flat and undisturbed, and as there is a chance to have an unlimited supply of water for pumping obtainable, it is true only at some expense, as it must be brought on pipes. I do not anticipate any difficulty whatever in sinking these. I saw the course of ore myself in the bottom of the old men's shaft, so can speak as to its richness with confidence.
Treiddol, Jan. 9. J. D.

PEMBROKESHIRE MINERALS.

SIR,—Having made an inspection of mining properties in the hundred of Dewland, in order to confirm my previous running inspection, I find myself quite justified to say that there is a wide field for capitalists to enter into—copper and lead also—to the north-west, and slate in abundance, several of the latter not even opened up, but most satisfactory indications of quality as well as quantity. I also made myself acquainted with the copper mining properties situate in the southern part, and at one place found the quality good even so near the surface as 15 ft., though the lode is under the average width, but appearances lead me to think well of it. The formation of surrounding rocks tend to further this belief. There are other lodes of great width, but outward appearance shows that although not so rich as the lode previously alluded to, there are 100,000 to 200,000 tons of what—owing to the improved machinery of modern days—will prove to be very fair marketable stuff. There is at one place indications of its having been formerly "tried," but in the most primitive manner possible. It surprises me that this property has not been looked into, as I understand that no objections would be made to place it on the market. I may also state that in digging a well on a certain farm they came upon slate, which an expert in those matters said was next in quality to "writing." The facilities for opening are first-class, as the spoil could be tipped into a valley, the top being next to mere surface; but against all this, I believe there is no disposition on the part of those interested to place it.—*St. David's, Jan. 9.* T. E.

LLANRWST LEAD MINE.

SIR,—I regret to trouble you again, but as the agent of this property mentioned my name in last week's Journal, I cannot allow his remarks to pass unanswered. The developments and provisions made by and for working this mine may bear favourable comparisons with others, but it entirely depends how those comparisons are made; Llanrwst is in 30,000 shares. My friends and clients had "unsolicited" circulars sent to them by persons connected in some way with the property, and the price in those circulars is 4£ to 4½ 5s. per share, equal to 120,000£ for the property. Another mine "in every way equal to Llanrwst" may be in 10,000 shares, selling at 2£ per share, equal to 20,000£ for the property—here is a comparison, with 100,000£ difference in value between the two mines. The 20,000£ property might be a cheap investment, while the 120,000£ property a very very dear one. Llanrwst may be substantially good in Mr. Robert Knapp's opinion. He ought (if he understands his business) to know more about the mine than anyone else, being underground every day, provided he does his duty as a paid servant of the company. I do not profess to be a practical miner; but being a shareholder wish to send my agent to inspect the mine; his opinion may not agree with Capt. Robt. Knapp's, but it will be honest, competent, and unbiased. The secretary of the company (Mr. J. Carter), although applied to three times, has neither had the politeness nor the good sense to reply to my request for an order to inspect. This alone is enough to injure the mine. If it is such a wonderful property (and it ought to be at 4£ per share—120,000£) why try to hinder any shareholder's agent from inspecting it? It is not my desire to injure Llanrwst or anyone connected therewith, whatever others may say or think to the contrary. I quite agree with Mr. Robert Knapp that honest, competent, and unbiased persons should inspect and manage mines. There would be a less number of mines and fewer rogues. As a paid servant of the company he (Capt. Knapp) oversteps the bounds when he states "others whose animus rises to the boiling point of venom and ungovernable ebullitions of temper," &c. Many underground agents require to be kept in their proper place; they forget their vocation; by the tenor of his letter he evidently appears to be out of his position. He savours more of the master than the servant. I will add that on Dec. 26 a mining inspector visited the mine, but could not get underground owing to a mishap to the gearing. I trust when my inspecting agent is there the gearing may not be out of order to prevent his going underground.
42, Poultry, E.C., Jan. 10 H. GOULD SHARP (shareholder),
 ——— Stock and Share Broker.

LLANRWST LEAD MINE.

SIR,—It will be admitted by everyone that facts speak for themselves. If, as Capt. Robert Knapp asserts in his letter of the 1st inst., "there are hundreds of tons of stuff still undressed and in course of dressing at the surface," it would, no doubt be very gratifying to most interested in the mine if he would explain how it is with the new—I believed the most approved—dressing machinery, he has been able to sample and sell only two lots of 50 tons each of lead ore; and am informed there was on the mine a fortnight since other 10 tons only towards another parcel. This I have in writing, which letter can be produced when requisite. It would appear that there must have been a screw loose somewhere. Whether from want of energy or from want of funds the dressing machinery has been so long in constructing and getting to work I will not express an opinion, but say that I do not know; but since Capt. Knapp has accused me of "advertising to him in an unjustifiable manner" instead of requesting me to surrender my authority after I stated "I could do it and when requisite." One thing I know, that on the occasion of Capt. Southey and my visit to Wales on a tour of inspecting the new and most approved dressing machinery, with a view of adopting and erecting such on the West Chiverton Mine, Capt. Knapp came from Llanrwst to meet us for the same purpose, and for three or four days I had the pleasure of his company, on which occasion I well remember him talking about the quantity of stuff at surface only awaiting the erection of suitable machinery to return it. This was in April, 1876, since which time Capt. Southey has had made, erected, and put into operation on an entirely new floor eight dressing machines, besides many more on the old dressing-floors, by means of which some thousands of tons of lead and blende ores have been made marketable and sold, and the stuff from one of the lodes in West Chiverton Mine contains lead, blende, copper, and mudiic, the four minerals amalgamated together, consequently it is very tedious and troublesome to dress, nevertheless it has been dressed, and, moreover, has been sold in large quantities, which leads me very reasonably to infer that if the mineral was so abundant at Llanrwst Mine as has been reported the dressing process must be carried on slowly, or the stuff—the ore—is not what it has been represented by those parties interested in puffing off the shares at 4£ to 4½ 5s. each. This I am aware does not

concern Capt. Knapp, whose account of the mine embodied in his letter of the 1st inst. is of a very mild character indeed, compared with the wonderful description given in certain circulars referred to by me some few weeks since, one of which stated in November last that the first dividend was to be paid the next—December—month, on the strength of which puff the shares were strongly recommended as an investment at 4l. or 4l. 5s., and it is a positive fact that the price for the shares on the open market was about 2l. only, and they are still being puffed at 4l., whilst the price on the market has been less than 2l. all this week, and the last two or three days they have been offered for sale at 32s. 6d. to 35s.

I have not nor do I call in question Capt. Knapp's ability or competency in the management of Llanrwst Mine, at the same time I do say, and it must be obvious to all impartial observers, that as applications for orders to have the mine inspected are treated with silence, and the orders are withheld, suspicion naturally arises that things are not so rosy as shareholders have been led to expect, and possibly some who have paid 4l. each for their shares, which means 120,000l. for the mine, and that when the working capital is all, or nearly all, spent. I leave facts to speak for themselves.

GRANVILLE SHARP.

A RETROSPECT.

SIR,—At the close of a year one is sometimes led to look back on the past, when events and experiences in great variety will come before the mental vision. I have lived through several reigns of English sovereigns—part of that of George III., that of George IV., that of William IV., and about 40 years of Victoria. I am, therefore, now an old man (but I do not feel it), and I wish to remind myself and your readers of the flight of time, which is carrying us on to "the congregation of the dead." In my time I have seen the rise of several men from obscurity and poverty to affluence and notoriety, and I have seen many so raised fall back again to their original littleness, and die in poverty. Some who inherited large estates and much money have wasted their all in gambling and expensive living. Many miners who began life as stamps boys or barrow boys underground have become owners of extensive estates. The late Mr. Beckford, of Fonthill Abbey, was left with an income of about 100,000l. per annum and a million in the funds. His father had expended about 350,000l. in the erection of the mansion, which did not please the son, so he pulled it down, and spent, I believe, another 350,000l. in building a mansion to suit his own taste. He built a high wall, several miles in length, to enclose the surrounding grounds attached to the Abbey. He was very proud, and very select in his invitations, so that he had few visitors, but he invited Lord Nelson and Lady Hamilton to a stay there. His style of living and some very expensive lawsuits reduced him to a condition in which he was only able to pay for private lodgings, and he so died—I think at Dawlish.

A poor man who lived in Madron, near Penzance, was taken notice of by a lady and educated for the law. About the commencement of the present century the Lord Arundell of that date became embarrassed, and falling into the hands of the lawyers, he who was the owner of 36 Cornish manors had to sell all except one, and that a small one, to satisfy the mortgages and the lawyers' bills of cost. The Madron man had the good fortune to get "a hand in the pie," so that two manors came to him for a small money payment. These manors, with a few other small tenements, brought an income of 1500l. per annum, which he devoted to his daughter's only son, who soon commenced a style of living which, in about 30 years, reduced the income to a very small amount. It went beyond the power of recovery; he was brought up to the law, but never practised—he was too proud for that; so he died in distress of mind, and soon afterwards the residue of his estates was sold for about 25,000l. to satisfy mortgages, &c. I said residue, I should have excepted 100 acres not yet sold.

I knew Capt. Andrew Vivian, of Camborne, who managed several mines about 50 or 60 years ago, amongst the rest Crenver and Wheal Abraham; but whatever he gained in one mine or mines went into others, for he left little behind him except a good name. I knew the late Capt. Davey, of Redruth, who commenced labour as a humble boy at 2s. 6d. per month. He became manager of several successful mines; to wit, Wheal Tolgus, Harmony and Montague, and the Great Consols, from which he acquired a good fortune, which he left to his two sons—Messrs. Stephen and Richard Davey, who considerably increased it by their shares in East Wheal Rose and Wheal Buller. From the latter they derived about 100,000l. profit. These gentlemen purchased several estates, so that, notwithstanding some subsequent losses in mines, they have not sunk their inheritance.

Capt. Thomas Teague, who died at Redruth about 30 years ago, was a great speculator in mines, two of which were valuable—the first was Wheal Trumpet, in Wendron, and the second Treavean, in Gwennap. From the latter he must have received nearly 100,000l. I think. But as he had many non-paying mines he left little behind him. Capt. Wm. Richards was his chief agent, who afterwards managed numerous unproductive mines, as did also his son, Capt. Thomas Richards, now living at Redruth, but their losses are said to have nearly equalled their gains.

Capt. Josiah Lyle, late of Bonython, near Helston, was the son of a mine agent about 60 years ago at Pembroke, near St. Austell. He had three sons—Samuel, Joseph, and John. Samuel got into debt, and died in the Fleet Prison, in London. Joseph became a mine agent, and in about the year 1834 set to work Carn Brea Mines, afterwards numerous other mines, including North Basset, Wheal Agar, Great South Tolgus, Carvannel, Wheal Grenville, South Grenville, &c. Carn Brea and North Basset made Capt. Lyle a moderately rich man, although his losses in the other mines were very considerable. He died about 10 years ago, leaving Bonython and other property of the value of about 45,000l. to his brother John, who, with his son, have, it is understood, spent nearly all.

Mr. R. Tyacke, of Godolphin, who died in 1825, married the daughter of Capt. Phillips, the previous occupier of that Barton, and manager of Great Work Mine, and thereby came into some property, besides that farm. When Messrs. John Gundry and Brothers failed, in 1819, their shares in Wheal Vor were sold, and Mr. Tyacke became the purchaser of some of them at a small price on the eve of the great returns which enriched many of the shareholders between that date and the year 1844, when the works ceased. The profits were nearly 300,000l. Mr. Tyacke left several sons (at least two), one is the vicar of Padstow, and another was a solicitor at Helston, who died about seven years ago.

Capt. William Teague, the manager of Tincroft, Carn Brea, and Wheal Kitty (St. Agnes), descended from a poor, but honest and respected, family. He is not ashamed to acknowledge that he was a poor mining boy; nor is there any reason that he should—for honest labour incurs no disgrace. About 24 years ago the late Mr. F. Pryor required an agent for Poldice Mine, and Capt. Joseph Vivian recommended William Teague as an intelligent man fit for the place. He was accepted at once, and after being at Poldice a year or two he was removed to Tincroft to do the work of a manager in Mr. Pryor's absence, who was the purser and manager thereof. He soon became the real manager and purser, having purchased the shares of a deceased owner of about one-third of the mine, whose widow wished to go out of mining. Capt. Teague purchased the shares at a cheap price compared with the subsequent value, for the mine soon became so rich, and the price of tin so high, that had Capt. Teague chosen to retire and sell out he could have put about 100,000l. in his pocket. He has never sold a share, but he has increased his interest by several purchases. At one time Capt. Teague's income was about 25,000l. per annum, but the reduction in tin has brought down his income to probably 5000l. per annum. Out of profits he has purchased numerous valuable estates, and he has built a beautiful mansion at Trelick, near Truro, around which he has about 150 acres of his own in his own hands. He purchased a manor in North Cornwall for 20,000l., which he has greatly improved by enclosures, &c. If Capt. Teague's shares in all his mines were worthless he is well off, having a good income from lands; but his interest in mines is still valuable. It is pleasing to see that Capt. Teague came into his wealth by honorable means, not by premiums or trickery as some of the London men have done. He has shown tact and sound judgment, but practised no trick on anyone. He is no dealer in shares, but a

steady holder; like Capt. Joseph Vivian always was in the mines which he managed.

The hopes for any material increase in the price of tin rest on a very sandy foundation. I wish it were otherwise, for we have had "bad times," and a change for the better is sadly wanted.

During the past year many honest, industrious, and apparently well-to-do men have succumbed under the pressure of circumstances "over which they have no control." We are surprised, day after day, to see in the list of bankrupts the names of men who we supposed were in solvent circumstances. The last surprise which I felt was occasioned by the intelligence, since confirmed, of the failure of Capt. David Cock, of Roche, a man supposed to be in a thriving way, as he was the purchaser of several freehold estates, and the part owner of numerous china-clay works. It is believed that the depression in the clay trade crushed him since he commenced dealing in it, the price having fallen very considerably. He and his family suddenly left Roche, for what destination I know not. I regret his exit, as he was a well-meaning man.

How long our deep tin mines will stand under present circumstances it is impossible to say, but it appears that Dolcoath, Tincroft, Carn Brea, and Pedn-an-drea will hold on a good while longer, and that some young mines—such as Treleigh Wood, Wheal Pevor, and Wheal Prussia—will rise into great prosperity with tin at 38l. per ton, tin which three or four years ago fetched nearly 90l. per ton. I suppose, too, that Phoenix Mine will stand on its legs a good while longer despite the miserable price of tin.

Jan. 8.

RETROSPECT.

NORTH LAXEY.

SIR,—I attended the general meeting yesterday, and I was surprised to hear several shareholders (who stated they had only recently joined the company) make themselves very officious and persistent in their remarks on the subject of the local management of the mine, as if they knew better about it than anyone else. The fact is that those who have for years been interested in the company are well aware that there is a general want of confidence in Captain Rowe, and unless a change takes place in the active superintendence of the mine I feel convinced it can never be made a success. At the meeting Captain Rowe was supported by Mr. Spittal; but will Mr. S. tell us why the Great Laxey directors (of whom Mr. S. is one) parted with Captain Rowe? And it is a significant fact that ever since that change took place Great Laxey has done much better than ever it did. I strongly advise the directors to make a change in the management, and they will be supported by the general body of shareholders. I for one have no faith in Captain Rowe's reports, as I don't remember his ever being right in one single instance, and not one of his promises have been fulfilled. I state this as—

Jan. 11.

A SHAREHOLDER FOR ABOUT TWENTY YEARS.

MINING IN NORTH DEVON—SOUTH MOLTON MINE.

SIR,—As you did me the honour of inserting my former letter I take the liberty of addressing you again. After some unavoidable hindrances the 22 fm. level has been reached at the South Molton Mine and the appearances at this level are very encouraging. There is a little debris to clear up, and as soon as this is done, and the level secured, a rise will be commenced to meet the winze from the 12, so that the lead ground standing between that level and the 22 can be stopped away. In the bottom of the 12, as I told you before, there is a very rich lode which will shortly be operated upon. In about a month a parcel of lead ore will be ready for sampling, and but for the hindrances alluded to there is little doubt that 20 tons of ore would have been sampled before Christmas. I think anyone seeing the appearance of the mine would say that it commences the New Year with such prospects as few mines can show. Our county has produced one of the richest copper mines in the world—Devon Great Consols. Who knows but we may also be able by-and-bye to show an important lead mine? There is every prospect at present of this at South Molton Mine.

South Molton, Jan. 9.

DEVON.

NEW CONSOLS MINING COMPANY.

SIR,—It is a pity persons do not take the trouble to obtain information as to what is being done in companies in which they are interested before writing letters to public journals. No one but those engaged in the task of unravelling and winding-up the affairs of a large public company can have any idea of the expenditure of labour and time which it involves. The liquidators have not been idle, but have incessantly devoted their time and energies to the liquidation, and fearlessly assert that no one would have done more than they have, or at a smaller cost. They are doing their utmost to make the most of their assets, and close the liquidation at the earliest possible moment, and they hope those who require information will apply to them for it before wasting valuable space in the papers.

ANOTHER CREDITOR.

BAD TIMES.

SIR,—A few years ago I printed about 300 copies of a "Map of Camborne, Illogan, Redruth, and Gwennap Mines," about 200 of which were sold at 21s. each. Finding, upon taking stock about two months ago, that I had about 100 copies left, I thought by offering them to the mining public at 5s. 3d. each I should materially and quickly reduce the stock. Accordingly I sent to the *Mining Journal* a short advertisement offering them at that price, and the result is that I have sold two copies, and no more. This is, indeed, a pretty rare indication that we do really "live in bad times."

Truro, Jan. 9.

R. SYMONS.

[For remainder of Original Correspondence, see to-day's Journal.]

"THE RAINBOW," a monthly magazine, which we have several times noticed, has been already issued for the present month, and being the first number for the year, and of a new series, especial pains have been taken to make its contents of more than usual interest. It opens with an address upon the New Year by the editor, Rev. W. Leask, D.D., which is the most admirable address on the opening year we have yet met with in any of our periodicals. Dr. Leask's style is remarkable for its grace, ease, and rhetorical beauty, and his thought is characterised by remarkable force and vigour. The article before us is pervaded by a sweet pathos eminently apropos of the close of an eventful year, and the dawn of another which will probably also prove eventful. The first article is from a well-practised pen, the learned and eloquent General H. Goodwin. If his genius as a warrior equals his power of logic, he may be considered a formidable opponent in every form of combat. He takes especial pleasure in dealing severe logic against superstitious theories of religion, and scientific conceits. In the present article he shines as an exegetical scholar. "The Argumentum ad Hominem" is the title of an article by another able hand. Sermons seldom appear in magazines, but this month's "Rainbow" contains what may be called a scientific one by Mr. Henry Deacon, lately delivered in Birmingham, which is unique in its character. Mr. Maude, sub-editor of the "Christian Herald," contributes a very elaborate article on "Christianity in Solution." The subject is, as far as we know, original, and it is handled in a manner that befits it. His first paragraph would suggest that he is a careful reader of the *Mining Journal*. It is—"When a chemist has a crystalline mass of some particular salt or metal which by long exposure to the atmosphere has become partially deliquescent, or by violent contact with other bodies has had the angles of its crystals abraded or broken off, and he wishes to restore the amorphous mass to its pristine integrity and beauty of form, what does he do? He dissolves it with the aid of heat in the appropriate menstruum, and allows the solution to evaporate till the process of crystallisation again commences. Until this is the case the salt or metal is said to be held in solution." Mr. Maude makes this "a chemical parable," or ingenious scientific representation of the present state of the Christian church, pervaded by so many obsolete and unreal doctrines, which must be expelled by moral, religious, and logical processes such as he depicts. Mr. Henry Constable devotes an article to strictures upon the lecture of Professor Torrance on "Future Punishment," a solemn subject, discussed with becoming gravity. There is reading for all sorts of men in this month's Rainbow, who love serious thought and profound reasoning.

EPPE'S COCOA—GRATEFUL AND COMFORTING.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Eppe has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame."—*Civil Service Gazette*. Sold only in packets labelled "JAMES EPPE and Co., Homoeopathic Chemists, London."

Meetings of Public Companies.

NORTH LAXEY MINING COMPANY.

A general meeting of shareholders was held at the company's offices, Austinfrs, on Thursday.—Mr. W. JARDINE in the chair. The SECRETARY read the notice convening the meeting, and the directors' report was then submitted:—

Your directors have thought it right to call the shareholders together to lay before them the financial position of the company, and the state and prospects of the mine, and to take into consideration the local management.

The present company was formed in August, 1873, and from that date to February, 1875, there were 2714 shares of 2l. each allotted, producing 5428l.; in 1875-6 there were 1764 shares allotted for 3528l.; and in 1876-7 there were 366 shares allotted for 732l.; making a total capital raised of 14,282l., irrespective of the bonus shares. Up to January, 1875, there were sold 165 ton lead ore for 2503l.; in 1875-6, 160 tons lead ore for 2437l.; in 1876-7, 120 tons lead ore for 1882l.; in 1877-8, 123 tons lead ore for 1651l.; making together, 568 tons lead ore 5827l. Thus in about 4½ years this company has expended on the mine the sum of 22,816l., and it will be observed that the larger the capital laid out the smaller have been the returns.

Since the general meeting in April last 123 tons of ore have been sold for 1651l., and after including this amount, and all other available assets, the net credit balance, after paying the cost to middle of December, is about 420l., which may meet the expenses to the middle of January.

Your directors have sent Capt. Plummer (a mine agent who has been favourably recommended by highly competent parties) to examine the mine, which he did on the 7th inst., and his report will now be laid before you.

From the above it will be seen that some immediate steps must be taken to raise more capital, and in that case your directors feel that the shareholders should express an opinion as to their confidence or otherwise in the local management, which has now for upwards of 2½ years had the control of the working of the mine. Some correspondence on this subject, and resolutions passed at a meeting of local shareholders, will be laid before you, and from these you will find that there is no prospect of obtaining fresh capital from shareholders in the Isle of Man "so long as the present management exists."—S. W. DAUKES, WM. JARDINE, GEORGE BLOGG (directors).

Jan. 8.—Acting on your instructions, I visited and inspected North Laxey Lead Mine, Isle of Man. I made a very careful examination of the works generally, and I desire in the first instance to tell you what levels I visited, what the present general appearance is, and what I recommend to you for future workings, and the probable capital that will be required. My attention was drawn to the bottom level (145). The north end is driven 10 fms.; the lode is poor. In the end it is composed of compact quartz and other veinstone; the containing rock is slate, and though at present of no commercial value it has a kindly appearance. The south end has been driven 9 fms., but the lode in the roof for this distance is comparatively poor. The end contains two branches of spar, each about 4 inches wide, and shows spots of lead. These branches are divided by a horse of slate about 4 ft. wide, and a pretty large stream of water is issuing from it. The end is of no economic value, but it is not unkindly. I next went to the forehead in the 136. The north end is driven about 10 fathoms; the lode in the end is poor, and is much broken up and generally disordered. The south end is driven 9 fms. to 10 fms. All the way in the roof the lode is quite poor, so in the present end. The north end in the 121 has been driven 50 fms. Several small deposits of ore were found in this level, and a good deal of the roof has been stopped away. A good piece of ore ground has been taken away in the bottom of this level. These places are not now working, but it is fair to assume the 136 and 145 will out these deposits when they are driven sufficiently far north. The south end in the 121 has been driven 17 or 18 fathoms; it is of no commercial value. I examined a stope in the roof of the 110, north of the shaft; it shows a nice little lode for 5 or 6 fms. long, worth about 10 cwt. per fathom. In the roof of this level there have been several places of like value, but they are scarcely rich enough to pay for working while lead sells so low. The north end in the 110 has been driven about 50 fms. The open ground in the roof indicates that ore has been taken away for about 20 fms. long. South of the north shaft, and so for 4 fms. south of the south shaft, I examined the lode; it is of no intrinsic value, but the present end shows a good strong lode, and I think it should be driven at least 50 fms. further.

The 96, north of shaft, shows a strong vein in places, and a good deal of the roof has been stopped away. The 84 has been driven north about 110 fathoms; I could not get to the far end on account of a defective roof, but a length of 145 fathoms has been slit out in the roof, indicating that some good ore was taken away. The south end in this level has been driven south of the south shaft 6 fathoms, and they have recommenced driving; the lode is 15 in. wide, composed of compact quartz, and the slate has a lively appearance, presenting a small portion of carbonate of lime and strings of lead and blende. The 73 has been driven south of the south shaft about 50 fathoms; I examined this level very carefully, several small trials have been made in the eastern side, about 25 fathoms from the shaft, and a branch came out from the east side and joined the main lode. A level has been driven 7 or 8 fathoms on this branch, though of no present value it has a kindly appearance, and it deserves further attention; from the point of contact with this branch to the end the lode is comparatively poor, and the present end shows a lode 8 or 9 in. wide, made up of spar and slate. I gave attention to the 60 and stopes below; this is the best working in the mine, and it shows a lode about 16 fms. long, the length of the stope is about 16 fathoms from the shaft, and south of a winze leading from the 60 to the 73; it is at present worked for about 7 fathoms long, very good ore can be seen for all this length, and it is standing in the end of ground 6 fathoms high, and will on the average yield 1 ton of ore to a fathom. This run of ore ground has not been seen in any of the levels below; the 73 has been driven considerably beyond this point, and as before intimated some slight trials have been made in the eastern side, but nothing has been seen of this run of ore ground below the actual point where the men are at work. It occurred to me that the greater underly would carry it into the west side, and I think it will be well to drive a small cross-cut and search for it in that side in the 73. To drive in the 84 and the 110, to get under this rich ore ground, seems to me a very desirable object.

From the 60 I came up through the old stope to the 50, examining the ends of ground and the stopes as I came; at present all this is poor, and abandoned. I examined the 40 fm. level from end to end; a great deal of open ground can be seen, both above and below the level; the ore part is worked away. Nothing more need be expected from this part, except new discoveries are made by extending the levels. Thus, having explained to you the places I have visited, and giving you a general view of the extent and appearance of the mine, I will offer my views as briefly as I can on what it will be desirable to do in future. I regret to inform you that I cannot take a very cheerful view of the places I have visited. You will notice that the ends are poor, and that the stopes are comparatively poor, except the one below the 60—and from this stope the present supplies are drawn; though there are other places containing ore it is better left in the mine than taken out at the present low price at which ore is selling. The mine, however, is in capital working order, the shafts are sunk in one instance to the 110 and another to the 145, the lode in depth has become more compact, and though the ends driven from these shafts are at present poor, there is an immense piece of ground at this point quite unexplored. The ore in the upper levels was not regular, and perhaps not so rich as could be desired, still there are two main runs of ore to be followed—one to the north and one to the south—and if the levels which I recommend are driven you have a fair chance of opening into ore ground, and if a short cross-cut is driven at the 73 it may give immediate results, and at once enable you to increase your ore sales. The 84 should be driven south, likewise the 118. The 145 should be driven both north and south, so as to get under the ore ground which was worked upon in the upper levels. What I recommend will cost in actual work underground 2280l. This is not a very weighty matter, and seeing that the general state of the mine is so good, the shafts in good order and sunk to a good depth, which is always the most expensive point in mining, the pumps work well, the roads and levels in good repair, and the ventilation good. Your agents have well attended to these matters, and I think they have displayed very proper judgment in keeping the mine in perfectly efficient state working. You have the means and appliances at hand for realising the produce the moment your vein is opened out.

With your permission I will again repeat what I recommend you to do—drive the 84 south 50 fms. further. Drive the 110 50 fms. further south. Drive a cross-cut west at the 73 (say) 3 fms. Drive the 145 north 50 fms. Drive the 145 south 100 fms. This would thoroughly test the mine. The lode is more compact in the deeper levels, and the chances of success are greater than in the levels higher up. The 84 and 110 would be likely to open out good ore when they are extended (say) 40 or 50 fms. further south. The ground below the 60 stope is the best run that has been seen for some considerable time. The short cross-cut in the 73 if successful will drive 50 fms. at 7l. per fathom = 350l. The 110 to drive 50 fms., at 7l. per fathom = 350l. The 7l. fm. level cross-cut 3 fms., at 7l. per fathom = 30l. The 145 south 100 fms., at 9l. per fathom = 900l. The 145 north 50 fms., at 9l. per fathom = 450l. Allow for sinking winzes, 200l.; total, 2280l. This sum would be needed for making the trials independent, the regular monthly charges against the mine, such as agencies, rent, taxes, water-charges, &c., must be provided for in addition. You have excellent water-wheels and machinery generally, and the dressing-floors are fitted up with a good crusher, improved jigs and round buddles. The work I have named should be carried out with dispatch, and all other work should be stopped, except the stope below the 40. It is not possible for anyone to speak positively on the quantity of ore these trials are likely to open out, but to judge from present appearances there can be no doubt the small sum I have named would be well spent. In conclusion, I beg to say there has been an immense amount of work done at these mines, and well done. In addition to the machinery and plant, there are good buildings all conveniently placed, and I think due economy has been observed. All you want now is richer veins, and when the trials are made I dare say you will find yourself in a much better position.—B. PLUMMER.

A letter from the representative of a meeting of certain Isle of Man shareholders, holding together about 1300 shares, was also read, stating that they felt considerable dissatisfaction at the state of affairs, requesting the directors to make an entire change in the local management, and suggesting that two local directors should be appointed, one of whom should be present at each pay. In the event of such change of management being made, but not otherwise, the Manx shareholders would be disposed to subscribe to the new capital required.

Mr. BYRON said there was evidently a strong feeling against the present local management, but he would like to know whether Capt. Plummer knew anything about the district. If he had no experience of the district he would place very little reliance upon his suggestions.

Mr. MURCHINSON said that Capt. Plummer was recommended by Messrs. John Taylor and Sons, and had had, he believed, large general experience.

Capt. ROWE agreed with every word in Capt. Plummer's report, and the mere fact of his having been recommended by Messrs. Taylor was an ample guarantee for his competency.

Mr. STURGE might remark that when they met on April 12 questions were put to Capt. Rowe, and he then gave a glowing account of the prospects of the mine, and expressed the opinion that only a comparatively small outlay would suffice to bring the mine into profit, that there was nothing equal in Laxey at the same depth, and so on, yet these promises, like all previous ones, had remained unfulfilled.

A SHAREHOLDER remarked that the balance-sheet at that meeting showed that they had 2380l. standing to their credit; so that if the mine only lost had only been 50l. per month, as promised, there would have been enough to go on with for four years, instead of that they had only about 400l. balance, and their returns were not increasing.

Capt. ROWE said he had come fully prepared to hear these objections. He

could not say a word against the general feeling of disappointment expressed at the difference of their prospects to-day. It would have been idle for him to have expected a more favourable reception. When he met the shareholders in April their prospects were favourable, and the full understanding was that the mine should be sunk so as to get it as deep as Laxey. This had been unproductive work and had also been very expensive. As this work did not afford them any help to meet expenses he carried on the shallow works toward Laxey, where a year since they appeared to have independent side-roads. The returns were at once favourably affected by the discovery, and yielded sometimes 2 tons, sometimes 1 ton per fathom. At the time of the last meeting they had three points going, and the ore promised to go up to the surface. From this they got out returns which promised to be permanent, and to go on to the southward and in depth. A month after the meeting they were pushing on four points on the side lode, which then got independent of the main lode, and the ore gave out. Previous to this they had hoped not only to maintain the 50 tons per month, but to increase it. The question of this side lode remains unproved at the 60, and it will produce 10 or 12 tons of ore this month, which showed that he was justified in believing that they had a paying lode. He might also mention that at the time of the last meeting they were obtaining 10s. 2s. 6d. per ton for their lead, whilst the last sale fetched but 12s. Although the thing was so aggravating to shareholders, it was the common lot of mining. What he had recommended to the directors was that they should suspend all except that returning ore, and drive at deeper levels to ascertain whether there was ore in depth. Capt. Plummer told him that what he (Rowe) had proposed to carry out he (Plummer) would recommend, and he had done so. He could not see that anything less or more could be done, and agreed with every word in Capt. Plummer's report. He did not go down the mine with Capt. Plummer, as they thought it better for him to wait for the Manx shareholders, who were coming at the same time. With these he went over the mine, and they stated that everything was laid out with the greatest economy, and that as to the surface works they thought that he deserved great credit. On Monday Mr. Noble stated that he was perfectly satisfied, and Mr. Maley remarked that if everything underground was as efficient as at surface he could not see what more could be done. None of the gentlemen gave him the slightest idea that they intended to recommend a change except Mr. Adam, who said he should do so in the hope of getting up the price of the shares; he also said that he would put no more money into the mine. He felt the proceedings most unfair to himself, as he had subscribed his proportion of each new issue, and although he had not the figures to refer to, he believed that he had paid more into the concern than he had received as salary. He cut the first of the mine, and had brought it down to the present important depth; and a man might now walk in his slippers, and by fulfilling what he proposed to do, and what Capt. Plummer also recommended, lay open the ore if it be there to lay open. He did not think it fair at such a time to ask a man to retire.

The CHAIRMAN said he had heard the same argument many times, but it was for the meeting to decide whether more capital should be subscribed.

Mr. MURCHISON stated that the works ought to have been well carried out, as altogether there had been spent on them by Capt. Rowe about 100,000l. of capital, besides the returns, which would make about 150,000l. altogether.

A SHAREHOLDER enquired what amount of money was required beyond the 3000l. for the exploratory works, and complained that the directors had expressed no opinion as to what should be done. It was unfair for a paid executive to throw all the onus of deciding on the shareholders. It would have been more manly and more charitable to their local manager if they had said we have no further confidence in Capt. Rowe, and wish you to sanction his removal. They should not have attempted to shelve themselves behind the present meeting. He (the speaker) was not a disappointed shareholder, having only been connected with the present company, and not with any of the previous ones to which the secretary had referred; and as to Capt. Plummer's report it was unquestionably satisfactory to Capt. Rowe, and it was uncharitable to find fault with because things had not turned out as they wished. It would have been more creditable to have supported him.

Several SHAREHOLDERS expressed the opinion that Captain Rowe should have another trial in carrying out the explorations recommended by Capt. Plummer.

Mr. MURCHISON said that Captain Rowe's non-success was not the only cause of complaint, but they had also to complain that, although he had been distinctly told not to sample ore until it was actually ready for delivery, he persisted in selling ore before he had almost half the quantity ready, and thus both the directors and the shareholders were deceived, and the company and the office brought into disrepute. The consequence was that expenses were incurred for demurrage, &c. Another thing was that they could not get from Captain Rowe the complete cost each month, and on some occasions merchants' bills had been sent up ten months after date.

Captain ROWE said it was difficult to get the accounts sent in.—Mr. MURCHISON remarked that the exact cost could be made up from the invoices, which should be sent with all goods delivered.—Several SHAREHOLDERS supported Mr. Murchison's view.

Mr. SPITTALL observed that there was no doubt that the fact of there having been so large an expenditure had caused this dissatisfaction; but it should be understood that the five shareholders in the Isle of Man who had held the meeting were holders of but 1300 or 1400 shares between them, whilst he himself held considerably more than half that number, and had heard nothing of the meeting; he had no notice, though resident in the island, and he knew nothing of the dissatisfaction until last Saturday. If the money had been improperly spent the directors were to be blamed for drawing their fees, and allowing the money to be squandered; but on Saturday, Capt. Rowe told him the same as he had to-day told the meeting, that the money had been expended in working the mine vigorously, and their balance was reduced because they had obtained so little ore.

The statement that he (Mr. Spittall) had only been to the mine twice in five years was untrue; he was there frequently. He did not take part in the practical management of the mine—that was not his business; but they had had a most unpleasant affair lower down the river, owing to their debris having nearly choked it up, and he had after great difficulty settled the matter upon terms very favourable to the company. He (Mr. Spittall) had taken up shares at every issue, and had certainly no interest in supporting Capt. Rowe, who had led him on to expend his money, but Capt. Plummer now recommended the expenditure of another 2000l., and he considered they could not find anyone better than Capt. Rowe to expend it. It was then unanimously resolved on the proposition of Mr. Blogg, seconded by Mr. Bixox, that the directors be authorised to take steps to raise the necessary capital for carrying out the recommendations of Capt. Plummer.

A SHAREHOLDER suggested that as to the sampling of ore not ready for delivery Capt. Rowe ought to be reprimanded, but he would give him another chance. After some further discussion it was proposed by Mr. Blogg, and seconded by Mr. DAUKES "That the directors be requested to make an entire change in the local management if necessary;" to which an amendment was moved to the effect that Capt. Rowe be retained in the management, but, being put to the meeting, the CHAIRMAN declared the amendment lost. Several shareholders then suggested that the original motion should be withdrawn, which suggestion was adopted, it being understood that by the Articles the directors have full power to change the managers and agents.

MARK VALLEY.—At a general meeting of adventurers, held at Salisbury, on Wednesday (Mr. E. Geach in the chair), the accounts showed a credit balance of 555l. 8s. 7d. The report of Captains William George and James Stenlake says—"We have eight stopes working on Rosedown lode, by 34 men, yielding in the aggregate 32 tons of ore per fathom; and 20 pitches, by 43 men, at tributaries varying from 8s. to 13s. 4d. in 14."

LIVINGSTONE CONSOLS.—A meeting of shareholders was held at the company's offices on Thursday (Mr. John B. Reynolds in the chair), when satisfactory arrangements were made in the interests of the company, and Mr. Reynolds consented to take the position of secretary. The reports from Capt. Stephen Davey, of Wheal Kitty (St. Agnes), W. T. White, of Wheal Peever, and John Nancarrow, of Camborne, were placed before the meeting and ordered to be entered in the cost-book. Beyond various matters of detail, there was nothing done of public interest.

NEW PRINCE OF WALES SLATE COMPANY.—At the meeting yesterday (Mr. Charles Barton in the chair) a resolution was passed for winding up the company voluntarily, with a view to reconstitution. Details will be given in next week's Journal.

VICTORIA (LONDON) MINING COMPANY.—An extraordinary general meeting of shareholders was held at the offices of the company, Moorgate-street, on Thursday, Mr. A. T. Thomson in the chair. The meeting was called for the purpose of electing an auditor. It was moved by Mr. Cobb, seconded by Mr. Prockter, that Mr. W. Brokes be elected an auditor of the company.

GREAT CARADON.—At a special meeting, yesterday, of the shareholders, a resolution was passed for the voluntary liquidation of the company. A full report of the proceedings will appear in our next week's number.

[For remainder of Meetings, see to-day's Journal.]

Died.—At Pool, Camborne, on Jan. 10, Capt. EDWIN HOSKING, aged 53. Capt. Hosking was many years agent at C. n. Brea, afterwards manager of Wheal Grenville, East Grenville, New Rosewarne, and Treleigh Wood, and prior to his death of Wheal Agar, Combmartin, and South Moulton Mines. Captain Hosking was highly respected, an able miner and upright man, possessing the esteem of his employers to the last.

HOLLOWAY'S PILLS.—It is difficult to determine what is the more trying to health, intense cold or excessive heat, though everybody knows that sudden transitions from the one to the other team with disease, which may in most instances be stayed off by an early resort to these purifying, regulating, and strengthening pills. This well known and highly esteemed medicine affords a safe and easy remedy for almost every constitutional wrong which climate, change, or dietetic errors can engender, and effectually removes any weakness self-indulgent habits may have induced. In all conditions of the system bordering on disease indicated by apathy, listlessness, Holloway's pills will prove especially serviceable in begetting a vivacity appreciated by both sound and sick.

ASBESTOS.

A NEW and INDESTRUCTIBLE ASBESTOS PACKING for steam joints and glands, possesses an unusual power of resisting heat, works efficiently under the highest pressure of steam, being practically indestructible. Apply to—

THE PATENT ASBESTOS MANUFACTURE CO. (LIMITED),
31, ST. VINCENT PLACE, GLASGOW,
AND 10, MARSDEN STREET, MANCHESTER.

WIRE ROPES.

JOHN AND EDWIN WRIGHT,

PATENTEES.



ESTABLISHED 1770.

MANUFACTURERS OF EVERY DESCRIPTION OF IMPROVED

PATENT ROUND AND FLAT WIRE ROPES, From the very best quality of Charcoal and Patent Steel Wire. Galvanised Wire Ropes for Ships' Rigging, Galvanised Signal and Fencing Strand, Copper Rope, Lightning Conductors, Colliery Ropes and Steam Plough Ropes made from the best Patent Improved Steel Wire.

PATENT ROUND AND FLAT HEMP ROPES, Hemp, Flax, Engine Yarn, Cotton Waste, Tarpaning, Oil Sheets, Bratties Cloth, Wagon Covers, &c., &c.

UNIVERSE WORKS, MILLWALL, POPLAR, LONDON.
UNIVERSE WORKS, GARRISON STREET, BIRMINGHAM.
CITY OFFICE, No. 5, LEADENHALL STREET, E.C.

All communications to be forwarded to the BIRMINGHAM ADDRESS.

BICKFORD'S PATENT SAFETY FUSE FOR CONVEYING CHARGE IN BLASTING ROCKS, &c. FIRE TO THE
Obtained the PRIZE MEDALS at the "ROYAL EXHIBITION" of 1851; at the "INTERNATIONAL EXHIBITION" of 1862 and 1874, in London; at the "IMPERIAL EXHIBITION," held in Paris, in 1855; at the "INTERNATIONAL EXHIBITION," in Dublin, 1865; at the "UNIVERSAL EXPOSITION," in Paris, 1867; at the "GREAT INDUSTRIAL EXHIBITION," at Antwerp, in 1868; TWO MEDALS at the "UNIVERSAL EXHIBITION," Vienna, in 1873; and at the "EXPOSICION NACIONAL ARGENTINA," Cordova, South America, 1872.

BICKFORD, SMITH AND CO., of TUCKINGMILL, CORNWALL; ADELPHI BANK CHAMBERS, SOUTH JOHN-STREET, LIVERPOOL; and 85, GRACECHURCH-STREET, LONDON, E.C., MANUFACTURERS AND ORIGINAL PATENTEES OF SAFETY-FUSE, having been informed that the name of their firm has been attached to fuse not of their manufacture, beg to call the attention of the trade and public to the following announcement:—EVERY COIL of FUSE MANUFACTURED by them has TWO SEPARATE THREADS PASSING THROUGH THE COLUMN OF GUNPOWDER, and BICKFORD, SMITH, AND CO. CLAIM SUCH TWO SEPARATE THREADS as THEIR TRADE MARK.

THE TAVISTOCK IRONWORKS, ENGINEWORKS FOUNDRY, AND HAMMER MILLS, TAVISTOCK, DEVON.

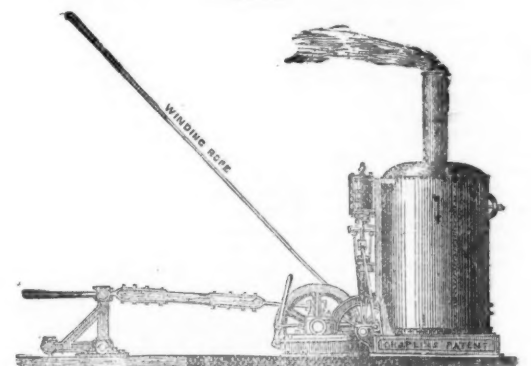
NICHOLLS MATHEWS, AND CO. ENGINEERS, BRASS AND IRON FOUNDERS, BOILER MAKERS AND SMITHS.

MAKERS OF CORNISH PUMPING, WINDING, AND STAMPING ENGINES; STEAM CAPSTANS AND CRUSHERS; WATER-WHEELS; PUMP-WORK; SHOVELS, AND HAMMERED IRON FORGINGS OF EVERY DESCRIPTION.

Also of SPUR, MORTICE, MITRE, BEVEL, and other WHEELS, of any diameter up to 12 feet, made by Scott's Patent Moulding Machine, without the aid of patterns, and with an accuracy unattainable by any other means. MACHINERY or FOREIGN MINES carefully prepared. SECONDHAND MINING MACHINERY, in good condition, always on sale, at moderate prices.

J. J. ARIS AND CO., MINING ENGINEERS, MINERAL AND METAL MERCHANTS, 29, FENCHURCH STREET, LONDON, E.C. Mines inspected and reported upon.

Prize Medal—International Exhibition, 1862.



CHAPLIN'S PATENT PORTABLE STEAM ENGINES FOR PUMPING AND WINDING.

SPECIALLY ADAPTED FOR PITS, QUARRIES, &c. SIMPLE AND STRONG; require NO FOUNDATION or CHIMNEY STALK, and are EASILY ERECTED or REMOVED.

Sizes, from 2 to 30-horse power. Steam Cranes, 1½ to 30 tons, for railways, wharves, &c.; hoist, lower, and turn round in either direction by steam.

Stationary Engines, 1 to 30-horse power, with or without gearing.

Hoisting Engines, 2 to 30-horse power, with or without jib.

Contractors' Locomotives, 6 to 27-horse power. Traction Engines, 6 to 27-horse power.

Ships' Engines, for winding, cooking, and distilling passed by H.M. Government for half water.

Steam Winches. Engines and Boilers for light screw and paddle steamers.

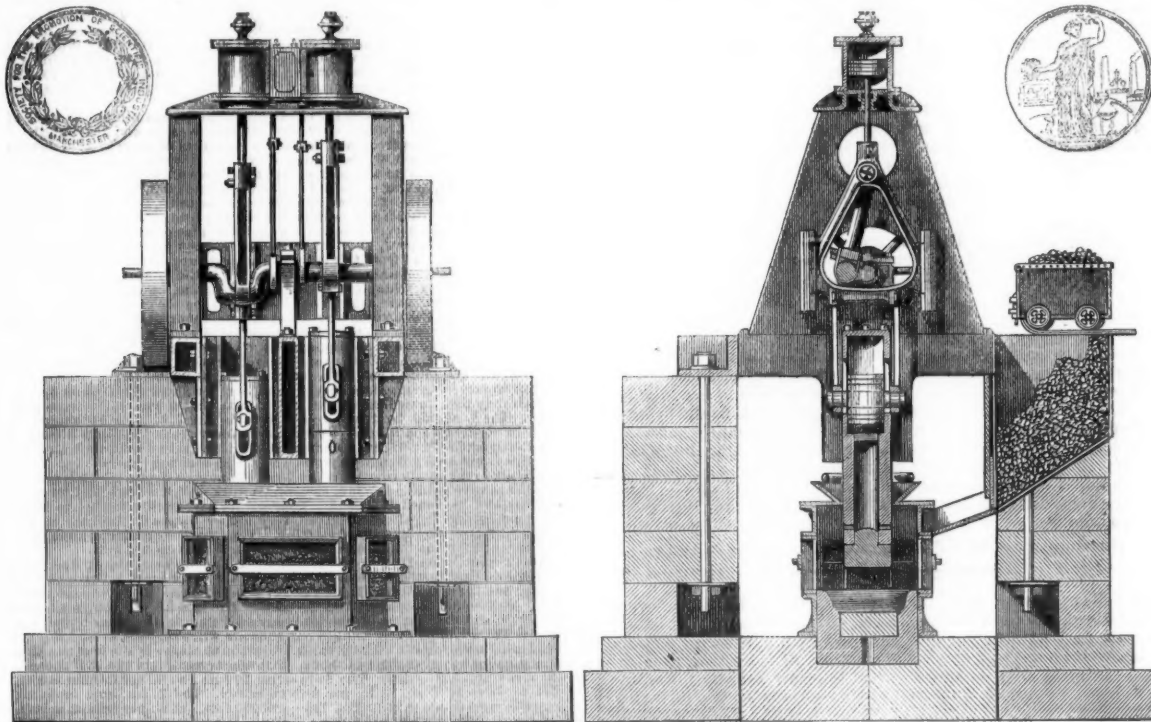
WIMSHURST, HOLLOCK, & CO., ENGINEERS.

CITY OFFICES: 2, WALBROOK, LONDON, E.C. WORKS: REGENT'S CANAL DOCK, 602, COMMERCIAL ROAD EAST, LONDON, E. [near Stepney Station.]

MR. W. F. STANLEY, MATHEMATICAL INSTRUMENT MANUFACTURER TO H.M. GOVERNMENT, COUNCIL OF INDIA SCIENCE AND ART DEPARTMENT, ADMIRALTY, &c. MATHEMATICAL, DRAWING, and SURVEYING INSTRUMENTS of every description, of the highest quality and finish, at the most moderate prices.

Price-list post free. ENGINE DIVISION TO THE TRADE. ADDRESS—GREAT TURNSTILE, HOLBORN, LONDON, W.O.

THE NEWCASTLE DAILY CHRONICLE (ESTABLISHED 1764.) THE DAILY CHRONICLE AND NORTHERN COUNTIES ADVERTISER. Offices, Westgate-road, Newcastle-upon-Tyne; 85, Howard street, North Shields; 195 High-street, Sunderland.



SHOLL'S PATENT DIRECT-ACTING PNEUMATIC STAMPERS,

For Pulverising Tin and Lead Ores, Gold Quartz, &c.,

SOLE MAKERS FOR CORNWALL,

N. HOLMAN AND SONS,

ST. JUST FOUNDRY, NEAR PENZANCE, CORNWALL.

All objectionable features of "wear and tear" common to the original and existing Pneumatic Stamps (driven by belt) are removed in this patent, and leather glands and stuffing boxes entirely dispensed with, the pneumatic piston being reciprocated into the compressing chambers by direct-action from without. These double machines are guaranteed to be of the capacity of 36 ordinary heads of cam and lifter stamps, and engineers will at once see that, inasmuch as the power is directly applied to its work (without the medium of belts and other gearing), the minimum consumption of coal (all other conditions being equal) must be the result.

The COST OF THESE MACHINES (including boiler) is about ONE-THIRD OF THE ORIGINAL CAM AND LIFTER STAMPS, to do the same work.

ROTARY STAMPERS SUPPLIED ON THE SAME PRINCIPLE, WITHOUT STUFFING BOXES OR GLANDS, WHERE RUNNING GEAR EXISTS, OR WITH HORIZONTAL CONDENSING ENGINES AND BELTS TO DRIVE THEM, IF PREFERRED.

Also, SOLE MAKERS OF STEPHENS' PATENT PULVERISER. MINING AND OTHER MACHINERY CONSTANTLY ON SALE, NEW AND SECOND-HAND.

AWARDED THE PRIZE MEDALS AT LEEDS, MANCHESTER, AND WREXHAM EXHIBITIONS, 1875 AND 1876.

HADFIELD'S STEEL FOUNDRY COMPANY,

ATTERCLIFFE, SHEFFIELD,

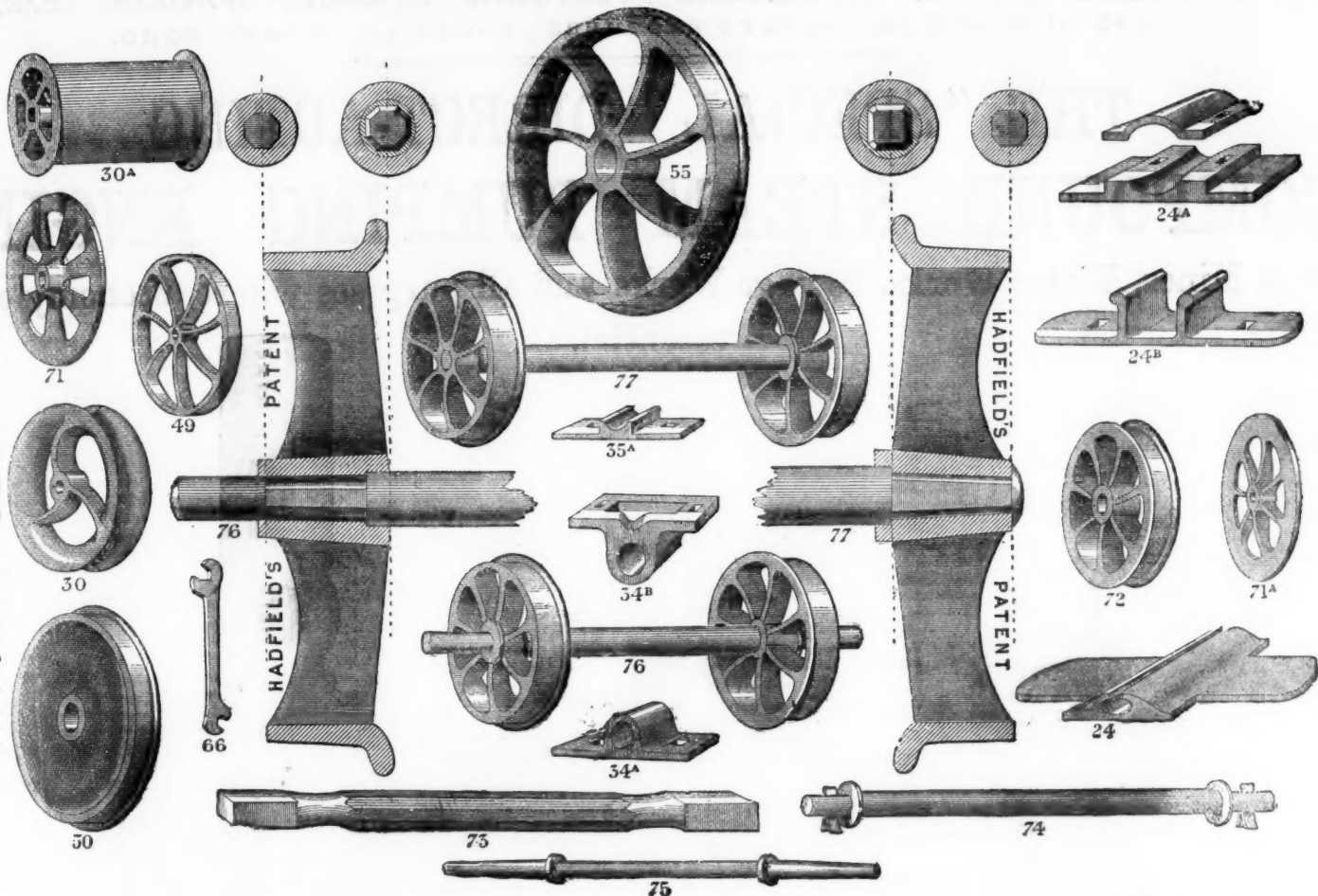
DEVOTE THEIR EXCLUSIVE ATTENTION TO THE MANUFACTURE OF

CRUCIBLE STEEL CASTINGS, for Engineering and Machine Purposes,

AND ARE THE SOLE MAKERS OF
HADFIELD'S CRUCIBLE STEEL WHEELS.

One of our departments is specially adapted for the manufacture of these Wheels (as shown below), for Collieries, Ironstone Mines, Slate Quarries, Ironworks, Lead Mines, &c., &c. We have made, and are now making, many HUNDRED THOUSANDS; and having Patented a New Method of Fitting Wheels upon axles, being cheap, effective, and expeditious, we can execute orders entrusted to us with promptitude, our capacity in this department alone being equal to about 2000 wheels per week.

N.B.—Prices per Set of Wheels and Axles, fitted complete, forwarded on receipt of diameter of wheel on tread, depth of tread, real gauge, and thickness of axles and rolling load.



[This Sheet of Drawings is Copyright]

HADFIELD'S PATENT METHOD OF FITTING WHEELS UPON AXLES.

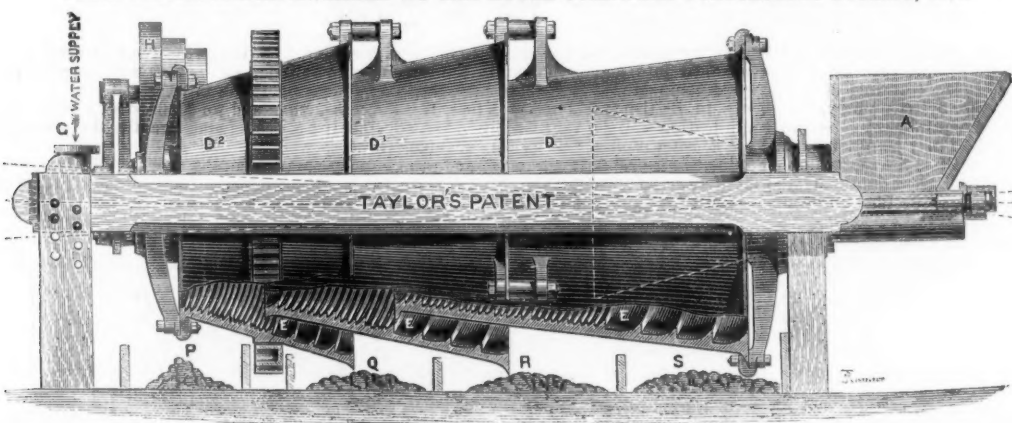
The advantages of the above system are that the Wheels being forced upon a Taper Square-ended Axle, by Machinery, and then riveted (the machine securing truth), it is impossible that they can come loose or get within gauge. They are very heavily fitted on, and run exceedingly true.

We construct the Arms of wheels upon the curved principle (as shown in the drawings above), consequently the shrinkage or cooling of the Castings is not interfered with, thus securing the greatest advantages of our very strong material.

CRUCIBLE CAST-STEEL WHEELS, when cast by us, are made from one-third to one-half lighter than Cast-Iron. They cannot be broken while working, even with rough usage, and will wear at least twelve times as long as Cast-Iron, thus saving animal and steam power, and reducing wear and tear immensely.

We would also draw special attention to our INCLINE PULLEYS and CAGE GUIDES, the adoption of which will prove highly advantageous.

FIRST SILVER MEDAL AWARDED BY THE ROYAL CORNWALL POLYTECHNIC SOCIETY, 1876.



TAYLOR'S PATENT DRUM DRESSER,

FOR SEPARATING AND SIZING MINERAL AND OTHER SUBSTANCES.

By the aid of this invention any materials, which are of different specific gravity, can be concentrated and sorted mechanically, while in the case of ores the fine mineral is brought up with the larger particles instead of being washed into the waste—a most important feature.

This machine uses very little water in proportion to the quantity of material treated, and will be found a most useful and efficient dressing apparatus.

For further particulars, and to see machines at work, apply to the Patentee,

H. E. TAYLOR, 15. Newgate Street, Chester.

MANCHESTER WIRE WORK.

NEAR VICTORIA STATION, MANCHESTER

(ESTABLISHED 1790).

JOHN STANIAR AND CO.,

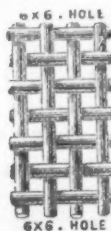
Manufacturers by STEAM POWER of all kinds of Wire Web, EXTRA TREBLE STRONG for

LEAD AND COPPER MINES.

Jigger Bottoms and Cylinder Covers woven ANY WIDTH, in Iron, Steel, Brass, or Copper

EXTRA STRONG PERFORATED ZINC AND COPPER RIDDLES AND SIEVES.

Shipping Orders Executed with the Greatest Dispatch.



IMPROVED IRON

SMITH'S

NO BRICKWORK

PRICES FROM

£6.15. NETT.

FREE ON G.N.R.

GILDERSOME.

HEARTH.

REQUIRED.

CAN BE TAKEN DOWN

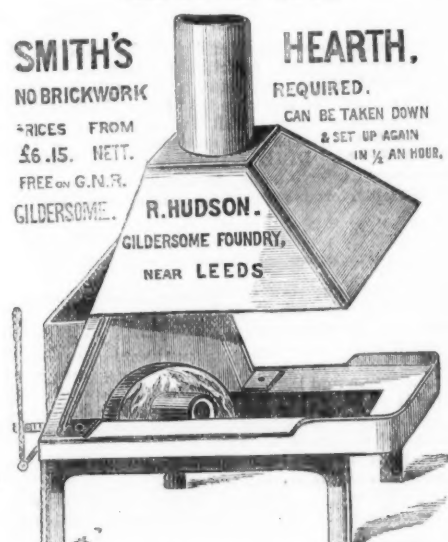
& SET UP AGAIN

IN 1/2 AN HOUR.

R. HUDSON.

GILDERSOME FOUNDRY,

NEAR LEEDS



GREAT SAVING IN ROOM.

BENNETTS' SAFETY FUSE WORKS

ROSKEAR, CAMBORNE, CORNWALL.

BLASTING FUSE FOR MINING AND ENGINEERING

PURPOSES.

Suitable for wet or dry ground, and effective in tropical or Polar climates.

W. BENNETTS, having had many years experience as chief engineer with Messrs. Blackford, Smith, and Co., is now enabled to offer Fuse of every variety of his own manufacture, of best quality, and at moderate prices.

Price Lists and Sample Cards may be had on application at the above address

LONDON OFFICE.—H. HUGHES, Esq., 25, GRACECHURCH STREET.

ELECTRIC BELL SIGNALS FOR COLLIERIES, FACTORIES, WAREHOUSES, &c.,

WITH OR WITHOUT GALVANIC BATTERIES.

NEW SYSTEM—CAN BE RUNG AT ANY PART OF THE ROAD. Cheap, safe, and reliable. Efficiency guaranteed. LINES OF TELEGRAPH erected and maintained. LIGHTNING CONDUCTORS, &c.

For estimates and particulars apply to—

SYDNEY F. WALKER,

LATE G. E. SMITH,

TELEGRAPH ENGINEER,

COMMERCIAL BUILDINGS, LONG ROW NOTTINGHAM.



PARIS INTERNATIONAL EXHIBITION, 1867.



VIENNA INTERNATIONAL EXHIBITION, 1873.



LONDON INTERNATIONAL EXHIBITION, 1874.



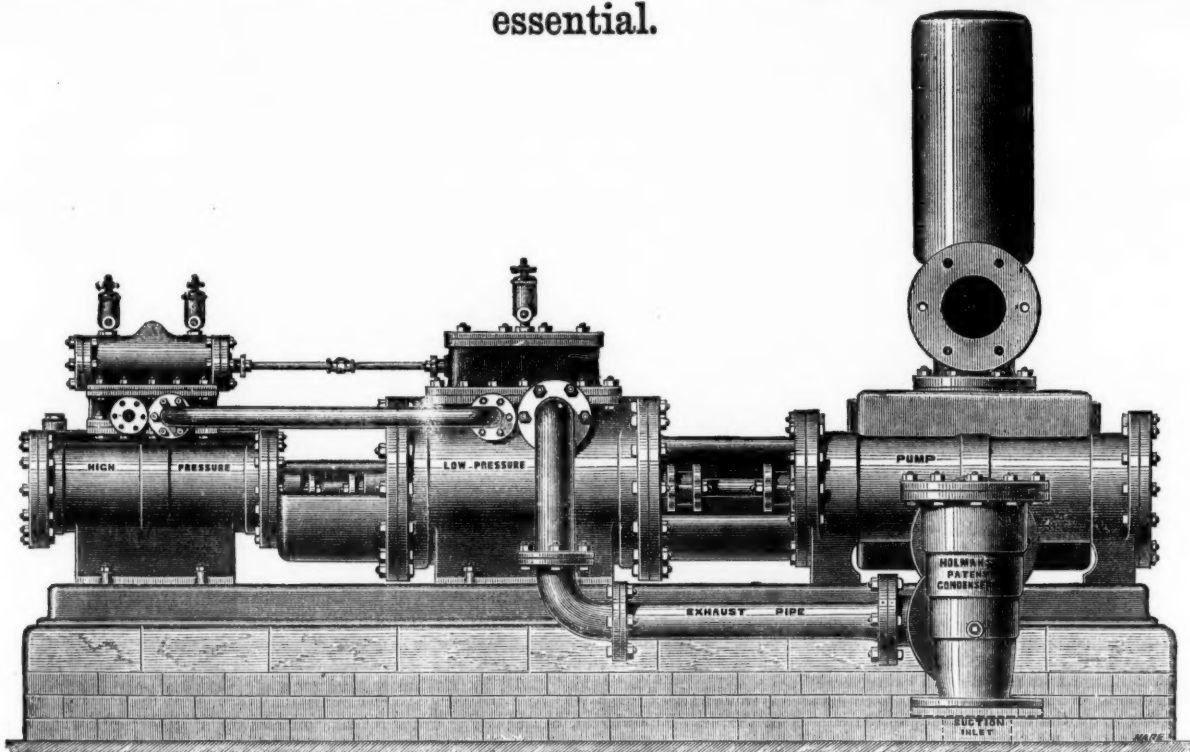
CORNWALL POLYTECHNIC SOCIETY, 1867 and 1873.

TANGYE BROTHERS AND HOLMAN,

HYDRAULIC AND GENERAL ENGINEERS,
CORNWALL HOUSE, 35, QUEEN VICTORIA STREET, LONDON, E.C.,
AND BIRMINGHAM, (TANGYE BROTHERS), CORNWALL WORKS, SOHO.

THE "SPECIAL" DIRECT-ACTING COMPOUND STEAM PUMPING ENGINE

For use in Mines, Water Works, Sewage Works, and all purposes where Economy of Fuel is essential.



After several years of successful application for all purposes to which steam-driven pumps can be applied, THE "SPECIAL" STEAM PUMP STILL MAINTAINS THE FIRST POSITION IN THE MARKET, notwithstanding that it alone—of all direct-acting pumps—has been subjected to the great variety of severe tests that must be encountered in such a period of time. Some valuable improvements have been suggested in the course of a long experience, and their adoption has rendered the apparatus at once

THE SIMPLEST AND MOST CERTAIN IN ACTION.

The illustration shows an extension of the principle of this Pump to a Compound Steam Pumping Engine, by which the economical advantages resulting from the expansion and condensation of steam are very simply and effectively obtained. The steam after leaving the high-pressure cylinder is received into and expanded in the low-pressure cylinder, and is thus used twice over before being exhausted into the condenser or atmosphere. The Engine combines simplicity, certainty of action, great compactness, fewness of parts, and consequent reduction in wear and tear.

Several thousands of the "Special" Steam Pumping Engines, with high-pressure cylinders only, are in use in British and Foreign Mines, Water Works, &c.,—and for confined situations, or where Engines of a comparatively small size only are necessary, they will still meet all requirements—but their application will be very largely increased, since it has been found practicable to embrace the important features of expanding and condensing the steam, so that increased power may be obtained, and the consumption of fuel greatly economised.

THE "SPECIAL" DIRECT-ACTING COMPOUND STEAM PUMPING ENGINE is the most simple appliance for deep mine draining and general purposes of pumping ever practically developed, and the first cost is very moderate compared with the method of raising water from great depths by a series of 40 to 50 fathom lifts. No costly engine-houses or massive foundations, no repetition of plunger lifts, ponderous connecting rods, or complication of pit-work are required, while they allow a clear shaft for hauling purposes.

SIZES AND PARTICULARS.

Diameter of High-pressure Cylinder.....In.	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14
Ditto of Low-pressure Cylinder.....In.	14	14	14	18	18	18	18	21	21	21	21	24	24	24	24
Ditto of Water Cylinder.....In.	4	5	6	5	6	7	8	6	7	8	10	7	8	10	12
Length of stroke.....In.	24	24	24	24	24	24	24	24	24	24	24	36	36	36	36
Gallons per hour approximate.....	3900	6100	8800	6100	8800	12,000	15,650	8,800	12,000	15,650	24,450	12,000	15,650	24,450	35,225
Diameter Suction and Delivery.....In.	3	3½	4	3½	4	5	6	4	5	6	8	5	6	8	9
Diameter High-pressure Steam Inlet.....In.	1½	1½	1½	1½	1½	1½	1½	2½	2½	2½	2½	2½	2½	2½	2½
Diameter Low-pressure Steam Exhaust.....In.	1½	1½	1½	1½	1½	1½	1½	2½	2½	2½	2½	2½	2½	2½	2½
Height in feet water can be raised with 40 lbs. pressure per square inch in cylinder.....	360	330	160	360	250	184	140	360	264	202	130	360	275	175	122
Ditto ditto ditto—with Holman's Condenser.....	480	307	213	480	333	245	187	480	352	269	173	480	367	234	162
Ditto ditto ditto—with Air-pump Condenser.....	600	384	267	600	417	306	335	600	440	337	216	600	459	203	203

CONTINUED.

Diameter of High-pressure Cylinder.....In.	16	16	16	16	18	18	18	18	21	21	21	24	24	24	30	30
Ditto of Low-pressure Cylinder.....In.	28	28	28	28	32	32	32	32	36	36	36	42	42	42	52	52
Ditto of Water Cylinder.....In.	8	10	12	14	8	10	12	14	10	12	14	10	12	14	12	14
Length of stroke.....In.	36	36	36	36	48	48	48	48	48	48	48	48	48	48	48	48
Gallons per hour approximate.....	15,650	24,450	35,225	47,950	13,650	24,450	35,225	47,950	24,450	35,225	47,950	24,450	35,225	47,950	35,225	47,950
Diameter Suction and Delivery.....In.	6	8	9	10	6	8	9	10	8	9	10	8	9	10	9	10
Diameter High-pressure Steam Inlet.....In.	2½	2½	2½	2½	3	3	3	3	3½	3½	3½	4	4	4	5½	5½
Diameter Low-pressure Steam Exhaust.....In.	3	2	3	3	3½	3½	3½	3½	4	4	4	5	5	5	6½	6½
Height in feet water can be raised with 40 lbs. pressure per square inch in cylinder.....	360	230	160	118	456	292	202	149	397	276	202	518	360	264	562	413
Ditto ditto ditto—with Holman's Condenser.....	480	307	213	154	603	389	269	198	528	363	269	691	480	352	750	550
Ditto ditto ditto—with Air-pump Condenser.....	600	384	267	191	750	486	337	248	660	450	337	864	600	440	937	689

PRICES GIVEN ON RECEIPT OF REQUIREMENTS.

Any number of these Engines can be placed side by side, to work in conjunction or separately as desired, thereby multiplying the work of one Pump to any extent.

NORTH OF ENGLAND HOUSE ... TANGYE BROTHERS AND RAKE, ST. NICHOLAS BUILDINGS, NEWCASTLE-ON-TYNE.
SOUTH WALES HOUSE... TANGYE BROTHERS AND STEEL, Tredegar Place, NEWPORT. Mon.; and Oxford Buildings, SWANSEA.

STEAM BOILERS

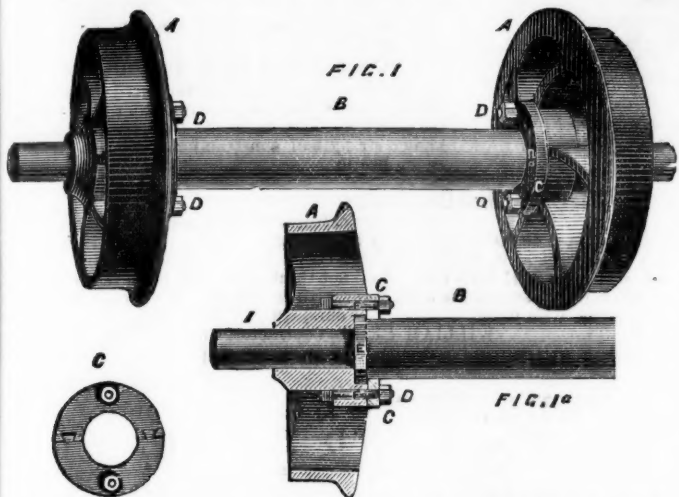
OF ALL KINDS MADE TO ORDER AT THE SHORTEST NOTICE BY THE

TURNBRIDGE IRON & BOILER WORKS COMPANY, LIMITED, HUDDERSFIELD.
London Agent—Mr. W. PARSEY, 46, FISH STREET HILL, E.C.

JOSEPH FENTON & SONS, SYKES WORKS, SHEFFIELD, and 118, Cannon-street, LONDON, E.C., MANUFACTURERS OF CRUCIBLE CAST STEEL CASTINGS,

HAVE PLEASURE IN CALLING THE ATTENTION OF THE MINING WORLD TO THEIR

Patent Method of Fitting up Cast Steel Wheels and Axles.

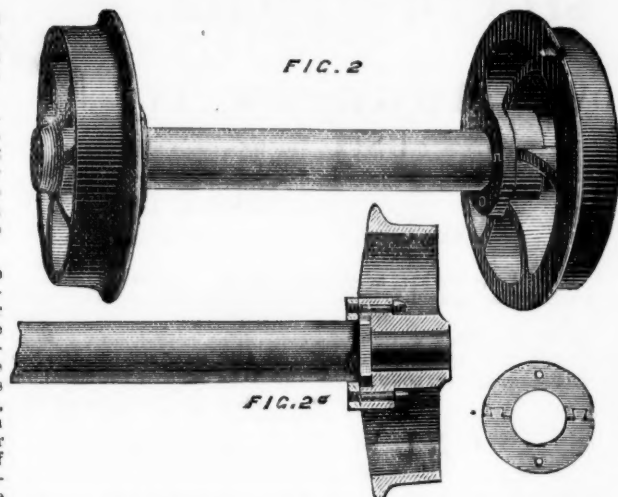


Figs. 1 and 1a show a longitudinal view and plan of a pair of corf wheels and axles fitted up for outside bearings. A A. are the wheels; B, is the axle; C C, the washers; D D, the bolts; E, the collar on axle B; and F, the recessed boss in the wheel.

The wheel is cast with a recessed boss in the inside, made to any shape, corresponding in shape and depth with a collar formed on the axle. Figs. 2 and 2a show a longitudinal view and plan of a pair of corf wheels fitted up for inside bearings. The washers are secured to the boss of the wheel in outside bearings by bolts and nuts, and in inside bearings by set screws.

The advantages of the above system are:—A, the singular simplicity of fitting—enabling any inexperienced person, with the aid of a spanner or screw-driver, to detach the wheels from the axle or fit them together in a very short time. B, perfect solidity, the wheels and axles becoming as one piece. C, durability, no need of putting the wheels or axles into the fire, under any circumstances, which is so detrimental to wheels, rendering them remarkably brittle, and which under other systems are detached from the axle by the aid of fire. D, economy in fuel and wages, saving hundreds of pounds yearly to large coal owners. The

important desiderata secured by this invention of simplicity (so often wanted in patents), solidity, durability, and economy, have not only been amply illustrated by the technical journals interested in the progress of mining operations in this country, but have at once been fully recognised by leading authorities in the mining world.

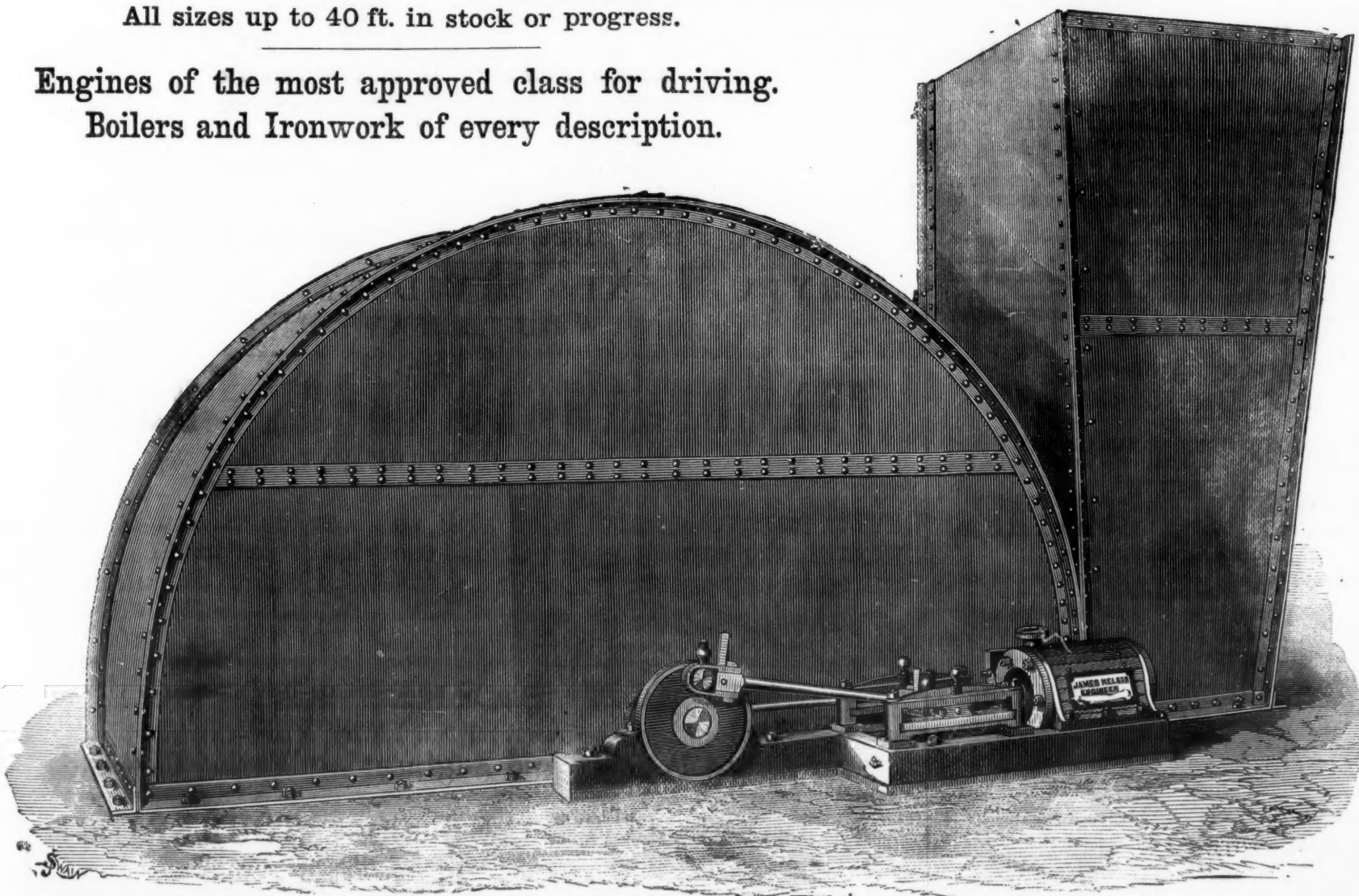


GUIBAL VENTILATING FAN FOR COLLIERIES AND MINES.

PRICES AND PARTICULARS ON APPLICATION.

All sizes up to 40 ft. in stock or progress.

Engines of the most approved class for driving.
Boilers and Ironwork of every description.



MANUFACTURED BY

JAMES NELSON, Marine and Stationary Engine Works,
GATESHEAD-ON-TYNE.

H. R. MARSDEN, PATENTEE AND ONLY MAKER BLAKE MACHINES, OF THE WELL-KNOWN ORE GRUSHERS AND STONE BREAKERS,

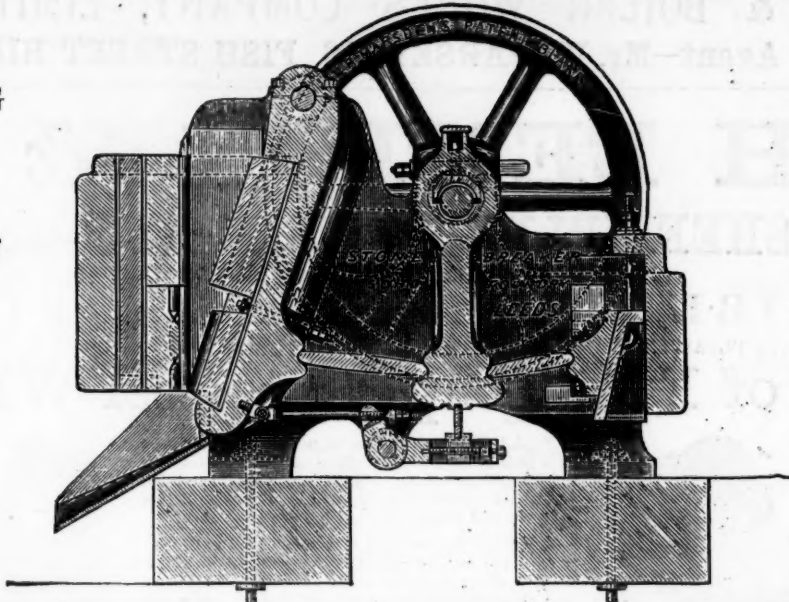
WITH THE
New Patent Reversible
CRUSHING OR CUBING
JAWS,

WHICH ARE CONSTRUCTED OF A PECULIAR
MIXTURE OF METAL, WEARING

Four times longer than any
other.

60 GOLD AND
SILVER MEDALS.

OVER 2000 NOW IN
USE.



For Crushing to any degree
of Fineness, or Breaking
to a required size.

Her Majesty's Government
USE THESE MACHINES

EXCLUSIVELY,

ALSO ALL THE GREAT

Mining Companies of the
World.

H. R. M. has long observed the want of cheaper
machines,

STONE AND ORE CRUSHERS,

And has at length, by means of improved appliances
for the production thereof, been enabled to reduce
the prices, yet keep up at the same time the well-
known strength of construction. Reduced prices
on application.

FIFTY per Cent., and upwards, saved by using these Machines.

TESTIMONIAL FROM MESSRS. JOHN TAYLOR AND SONS.

6, Queen-street-place, May 10, 1877.

DEAR SIR,—We have adopted your Stone Breakers at many of the mines under our manage-
ment, and are pleased to be able to state that they have in all cases given the greatest satisfac-
tion. We are, yours faithfully,

H. R. Marsden, Esq.

JOHN TAYLOR AND SONS.

INTENDING BUYERS ARE CAUTIONED AGAINST PURCHASING OR USING ANY INFRINGEMENT OF THE NUMEROUS PATENTS OF H. R. MARSDEN.
ILLUSTRATED CATALOGUES, TESTIMONIALS, and every information, on application to:—

H. R. MARSDEN, SOHO FOUNDRY, LEEDS, ENGLAND.
ONLY MAKER OF SAULT'S PATENT SYPHON CONDENSER.

DEAR SIR,—I have broken over 40,000 tons of very hard LIMESTONE into ROAD METAL, for
the Newport and other Road Trusts, in your PATENT STONE BREAKER, AND ALL WITH
ONE PAIR OF JAWS, which are STILL IN USE. I do not think at all, but am quite sure yours
are the only Machines which fully perform the work you set them out to do, and there are none
in the Show can at all compare with them. Yours, truly,

H. R. Marsden, Esq.

WILLIAM PRICE, Contractor, Gold Cliff, Monmouth.

Royal Agricultural Show, Liverpool, July, 1877.

TO COLLIERY AND MINE OWNERS.

R. HUDSON'S PATENT STEEL CORVES OR "TRAMS."

Patented July, 1875, and January, 1877.

Entire new principle, saving three-quarters to 2 cwt. "dead" weight per corve. Will hold 2 to 3 cwt. more coal than the ordinary kind, without increasing the outside dimensions. Adopted by—

Messrs. THOMPSON, WISE, & Co., Burry Port, South Wales.
Messrs. DYMONDS' Liversedge Coal Company, near Leeds.
Messrs. W. ACKROYD and Bros., Morley, near Leeds.
Messrs. CLAYTON and SPRIGHT, Farnley, near Leeds.
Messrs. JAS. WORMALD and Sons, Rawdon, near Leeds.
KINGSWOOD COAL and IRON Co., near Bristol.
MIDDLETON COLLIERY Co., near Leeds.

Messrs. BARING, GOULD, & ATKINSON, Diamond Fields, South
Africa.
Messrs. KIMBERLEY, Diamond Mines, South Africa.
Mr. HASELDEN'S Lead Mines, Linares, Spain.
FRYSTON COLLIERY Co. (Limited), Castleford, near Leeds.
HOWDEN CLOUGH COLLIERY Co. (Limited), near Leeds.
NEWTON COLLIERY, near Castleford.

Messrs. R. HOLLIDAY and Sons, Ardeley, near Wakefield.
HARDWICK COLLIERY Co., Clay Cross, near Chesterfield.
WEST YORKSHIRE IRON and COAL Co. (Limited), Tingley, near Leeds.
WM. BAIRD and Son, Coatbridge, near Glasgow.
BETTSFIELD COLLIERY COMPANY, Bagillt, Wales.
EDFORD COLLIERY COMPANY, near Bath.
Messrs. JAS. FUSSELL, Sons, and Co., Frome, Somersetshire.

T. VAUGHAN and Co.'s TRUSTEES, South Medomsley Colliery; and others.

R. HUDSON, Engineer and Ironfounder, Gildersome Street Foundry, near Leeds (Five minutes walk from Gildersome Station, G.N.R.)

The Barrow Rock Drill COMPANY

Are NOW PREPARED to SUPPLY their DRILLS, the ONLY
ONES that have been SUCCESSFULLY WORKED in the
MINES of CORNWALL. At DOLCOATH MINE, in the
HARDEST known ROCK, a SINGLE MACHINE has, since
its introduction in July, 1876, driven MORE THAN THREE
TIMES the SPEED of HAND LABOUR, and at TWENTY PER
CENT. LESS COST PER FATHOM.

In ordinary ends two machines may be worked together,
and at a proportionately increased speed. They are strong,
light, and simple, easily worked, and adapted for ends and
stopes, and the sinking of winzes and shafts.

The company are also prepared to SUPPLY COMPRESSORS,
and all necessary appliances for working the said Drills.

Apply to—

LOAM AND SON,
LISKEARD, CORNWALL.

IMPROVED STEEL WIRE FOR ROPES.

WEBSTER & HORSFALL,
(ORIGINAL PATENTEES),

MANUFACTURERS OF IMPROVED STEEL WIRE FOR ROPES
FOR COLLIERIES,

RAILWAY INCLINES, PLOUGHS, HAWSERS, &c.

SOLE MANUFACTURERS of the HOMOGENEOUS WIRE for the
ATLANTIC CABLES of 1865 and 1866.

WEBSTER AND HORSFALL,
BIRMINGHAM.

THE GREAT ADVERTISING MEDIUM FOR WALES.

THE SOUTH WALES EVENING TELEGRAM
(DAILY), and
SOUTH WALES GAZETTE
(WEEKLY), established 1867,

the largest and most widely circulated papers in Monmouthshire and South Wales
CHIEF OFFICES—NEWPORT, MON.; and at CARDIFF.

The "Evening Telegram" is published daily, the first edition at Three P.M., the
second edition at Five P.M. On Friday, the "Telegram" is combined with the
South Wales Weekly Gazette, and advertisements ordered for not less than six
consecutive insertions will be inserted at a uniform rate in both papers.
P.O.O. and cheques payable to Henry Russell Evans, 14, Commercial-street
Newport, Monmouthshire.

THE IRON AND COAL TRADES' REVIEW.
The IRON AND COAL TRADES' REVIEW is extensively circulated amongst the
Iron Producers, Manufacturers, and Consumers, Coalowners, &c., in all the iron
and coal districts. It is, therefore, one of the leading organs for advertising every
description of Iron Manufactures, Machinery, New Inventions, and all matters
relating to the Iron, Coal, Hardware, Engineering, and Metal Trades in general.
Offices of the Review: 7, Westminster Chambers, S.W.
Remittances payable to W. T. Fringle.

BRYDON AND DAVIDSON'S ROCK DRILL.

SELECTED BY THE BRITISH AND OTHER GOVERNMENTS.

Reduced prices of this Rock Drill, Nos. 1 and 2, £32 and £34.

SUBJECT TO DISCOUNT.

IMPROVED AIR COMPRESSORS.

Makers of Pumping and Winding Engines, Steam Hammers,
Boilers, Pump Pipes, &c., &c. Castings of all kinds.

BRYDON AND DAVIDSON, ENGINEERS,
WHITEHAVEN.

THE ROANHEAD ROCK DRILL.

BY ROYAL LETTERS PATENT.

This justly-celebrated Rock Drill, the only one invented that will
work in the hardest rock without more than the usual repairs re-
quired by any ordinary machinery, is now offered to the public.

It has been most successfully worked in the well-known Hematite Mines of Lancashire and Cumberland. Will drive 50 to 60 ft.
in hard rock without change of drill, and can be worked by any miner, and kept in repair by any blacksmith. It is the most
simple rock drill ever invented, and cannot with fair usage get out of order.

Plans, Estimates, including Compressors, and all other Mining Machinery, supplied on application to the sole makers,—

SALMON BARNES AND CO.,

MINING ENGINEERS.

Canal Head Foundry and Engineering Works, Ulverston.

J. WOOD ASTON AND CO., STOURBRIDGE

(WORKS AND OFFICES ADJOINING CRADLEY STATION),

Manufacturers of

CRANE, INCLINE, AND PIT CHAINS,

Also CHAIN CABLES, ANCHORS, and RIGGING CHAINS, IRON and STEEL SHOVELS, SPADES,
FORKS, ANVILS, VICES, SCYTHES, HAY and CHAFF KNIVES, PICKS, HAMMERS, NAILS,

RAILWAY and MINING TOOLS, FRYING PANS, BOWLS, LADLES, &c., &c.

Orab Winches, Pulley and Snatch Blocks, Screw and Lifting Jacks, Ship Knees, Forgings, and Use Iron of all descriptions.

STOURBRIDGE FIRE BRICKS AND CLAY.